Vol. 1122 Number 2

OFFICIAL GAZETTE

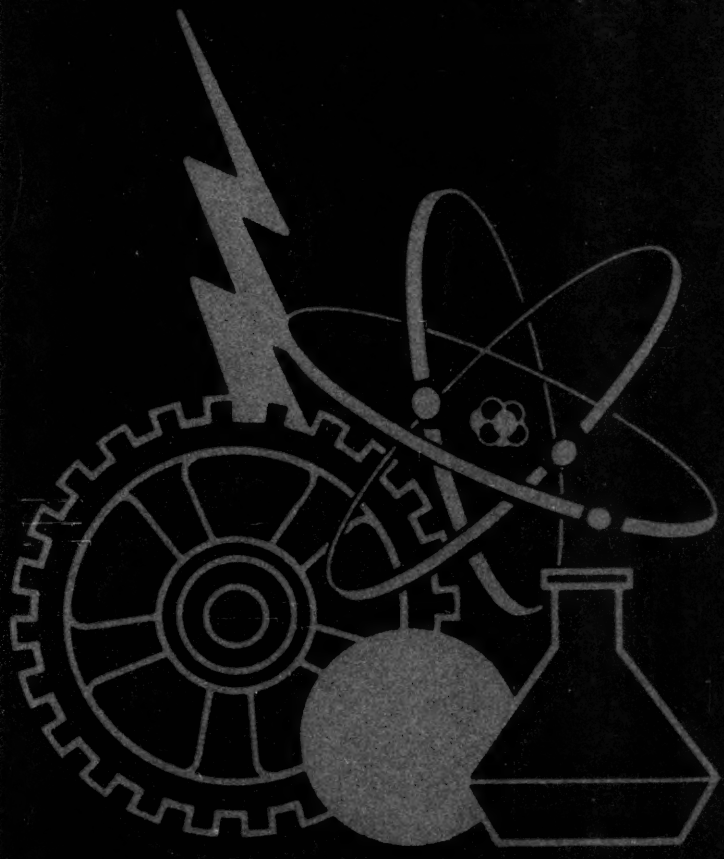
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

January 8, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

[26] In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1120 O.G. 14 on Nov. 27, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the amount of the fee in German Marks and the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 3, 1991, and was announced in the *Official Gazette* at 1122 O.G. 566 on Jan 1, 1991.

International fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1492.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 6, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 1, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,716,594 through 4,718,121
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 3, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,423,523 through 4,424,594
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$850.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 28, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,355,450	06/268,933	10/26/82
4,355,497	06/222,656	10/26/82
4,355,543	06/215,702	10/26/82
4,355,545	06/295,040	10/26/82
4,355,572	06/253,373	10/26/82
4,355,591	06/270,140	10/26/82
4,355,600	06/218,436	10/26/82
4,355,608	06/217,096	10/26/82
4,355,612	06/231,982	10/26/82
4,355,623	06/238,836	10/26/82
4,355,678	06/240,185	10/26/82
4,355,713	06/239,679	10/26/82
4,355,729	06/225,306	10/26/82
4,355,746	06/294,721	10/26/82
4,355,782	06/228,149	10/26/82
4,355,786	06/293,927	10/26/82
4,355,788	06/273,018	10/26/82
4,355,819	06/217,729	10/26/82
4,355,892	06/217,787	10/26/82
4,355,937	06/219,657	10/26/82
4,355,951	06/311,975	10/26/82
4,355,957	06/274,897	10/26/82
4,355,971	06/221,132	10/26/82
4,355,976	06/306,993	10/26/82
4,355,997	06/273,951	10/26/82
4,356,020	06/323,439	10/26/82
4,356,024	06/233,250	10/26/82
4,356,028	06/295,250	10/26/82
4,356,057	06/266,135	10/26/82
4,356,059	06/322,109	10/26/82
4,356,066	06/248,141	10/26/82
4,356,069	06/241,889	10/26/82
4,356,077	06/221,949	10/26/82
4,356,095	06/223,463	10/26/82
4,356,128	06/257,674	10/26/82
4,356,131	06/229,679	10/26/82
4,356,132	06/273,776	10/26/82
4,356,167	06/276,034	10/26/82
4,356,169	06/248,785	10/26/82
4,356,183	06/239,602	10/26/82
4,356,186	06/246,114	10/26/82
4,356,207	06/280,661	10/26/82
4,356,211	06/218,155	10/26/82
4,356,234	06/240,834	10/26/82
4,356,250	06/224,415	10/26/82
4,356,256	06/295,444	10/26/82
4,356,260	06/252,473	10/26/82
4,356,276	06/302,661	10/26/82
4,356,289	06/223,720	10/26/82
4,356,301	06/219,405	10/26/82
4,356,308	06/248,563	10/26/82
4,356,313	06/235,376	10/26/82
4,356,314	06/236,076	10/26/82
4,356,319	06/226,382	10/26/82
4,356,323	06/252,460	10/26/82
4,356,324	06/221,915	10/26/82
4,356,360	06/238,304	10/26/82
4,356,407	06/254,707	10/26/82
4,356,434	06/242,976	10/26/82
4,356,458	06/297,725	10/26/82
4,356,492	06/228,428	10/26/82
4,356,497	06/299,646	10/26/82
4,356,526	06/268,317	10/26/82
4,356,527	06/265,817	10/26/82
4,356,560	06/260,283	10/26/82
4,356,563	06/275,020	10/26/82
4,619,004	06/730,636	10/28/86
4,619,005	06/726,427	10/28/86
4,619,006	06/706,325	10/28/86
4,619,010	06/783,047	10/28/86
4,619,011	06/721,271	10/28/86
4,619,013	06/769,163	10/28/86
4,619,046	06/804,246	10/28/86
4,619,047	06/698,826	10/28/86
4,619,048	06/603,548	10/28/86
4,619,063	06/694,122	10/28/86
4,619,064	06/763,085	10/28/86
4,619,065	06/663,399	10/28/86
4,619,073	06/739,582	10/28/86
4,619,074	06/764,756	10/28/86
4,619,078	06/622,709	10/28/86
4,619,081	06/706,620	10/28/86
4,619,108	06/725,271	10/28/86
4,619,116	06/598,371	10/28/86

Patent Number	Serial Number	Issue Date
4,619,119	06/695,987	10/28/86
4,619,124	06/776,788	10/28/86
4,619,129	06/552,504	10/28/86
4,619,134	06/614,732	10/28/86
4,619,135	06/661,360	10/28/86
4,619,140	06/659,584	10/28/86
4,619,155	06/485,178	10/28/86
4,619,163	06/629,179	10/28/86
4,619,165	06/688,592	10/28/86
4,619,166	06/694,774	10/28/86
4,619,168	06/771,268	10/28/86
4,619,187	06/638,447	10/28/86
4,619,191	06/663,090	10/28/86
4,619,192	06/679,392	10/28/86
4,619,198	06/686,040	10/28/86
4,619,200	06/716,728	10/28/86
4,619,218	06/574,871	10/28/86
4,619,237	06/799,277	10/28/86
4,619,243	06/748,614	10/28/86
4,619,245	06/522,107	10/28/86
4,619,256	06/415,806	10/28/86
4,619,258	06/585,565	10/28/86
4,619,260	06/668,098	10/28/86
4,619,266	06/608,446	10/28/86
4,619,269	06/599,080	10/28/86
4,619,272	06/754,844	10/28/86
4,619,273	06/520,348	10/28/86
4,619,280	06/474,975	10/28/86
4,619,288	06/795,337	10/28/86
4,619,297	06/686,004	10/28/86
4,619,306	06/540,631	10/28/86
4,619,312	06/551,993	10/28/86
4,619,315	06/721,819	10/28/86
4,619,327	06/689,214	10/28/86
4,619,329	06/710,998	10/28/86
4,619,331	06/757,291	10/28/86
4,619,336	06/597,463	10/28/86
4,619,341	06/742,012	10/28/86
4,619,362	06/793,396	10/28/86
4,619,363	06/695,876	10/28/86
4,619,365	06/678,655	10/28/86
4,619,366	06/791,926	10/28/86
4,619,368	06/758,890	10/28/86
4,619,369	06/710,857	10/28/86
4,619,372	06/854,389	10/28/86
4,619,373	06/784,549	10/28/86
4,619,376	06/699,562	10/28/86
4,619,379	06/646,650	10/28/86
4,619,385	06/350,075	10/28/86
4,619,386	06/608,399	10/28/86
4,619,391	06/601,574	10/28/86
4,619,393	06/744,124	10/28/86
4,619,397	06/677,189	10/28/86
4,619,399	06/640,013	10/28/86
4,619,403	06/685,161	10/28/86
4,619,408	06/583,931	10/28/86
4,619,410	06/727,586	10/28/86
4,619,412	06/766,970	10/28/86
4,619,413	06/554,258	10/28/86
4,619,420	06/744,202	10/28/86
4,619,422	06/568,825	10/28/86
4,619,429	06/657,983	10/28/86
4,619,432	06/737,015	10/28/86
4,619,439	06/581,200	10/28/86
4,619,440	06/575,883	10/28/86
4,619,451	06/666,946	10/28/86
4,619,453	06/667,418	10/28/86
4,619,454	06/739,097	10/28/86
4,619,457	06/699,311	10/28/86
4,619,468	06/693,536	10/28/86
4,619,478	06/769,265	10/28/86
4,619,483	06/656,365	10/28/86
4,619,484	06/651,572	10/28/86
4,619,507	06/525,416	10/28/86
4,619,524	06/656,876	10/28/86
4,619,536	06/536,906	10/28/86
4,619,546	06/665,633	10/28/86
4,619,547	06/602,785	10/28/86
4,619,550	06/658,122	10/28/86
4,619,582	06/790,961	10/28/86
4,619,586	06/633,099	10/28/86
4,619,588	06/603,599	10/28/86
4,619,590	06/725,956	10/28/86
4,619,592	06/586,414	10/28/86
4,619,595	06/600,903	10/28/86
4,619,596	06/433,700	10/28/86
4,619,602	06/691,471	10/28/86
4,619,603	06/681,598	10/28/86
4,619,610	06/754,944	10/28/86
4,619,614	06/646,211	10/28/86
4,619,617	06/764,347	10/28/86
4,619,618	06/722,345	10/28/86
4,619,626	06/696,587	10/28/86
4,619,627	06/667,336	10/28/86
4,619,631	06/751,583	10/28/86
4,619,637	06/740,638	10/28/86
4,619,638	06/429,372	10/28/86
4,619,646	06/693,060	10/28/86
4,619,654	06/688,815	10/28/86
4,619,656	06/569,610	10/28/86
4,619,660	06/661,105	10/28/86
4,619,661	06/551,987	10/28/86
4,619,668	06/774,698	10/28/86
4,619,672	06/774,694	10/28/86
4,619,678	06/754,615	10/28/86
4,619,688	06/688,844	10/28/86
4,619,692	06/755,132	10/28/86
4,619,693	06/721,461	10/28/86
4,619,696	06/677,644	10/28/86
4,619,717	06/602,914	10/28/86
4,619,728	06/647,571	10/28/86
4,619,734	06/727,246	10/28/86
4,619,743	06/755,528	10/28/86
4,619,751	06/726,507	10/28/86
4,619,756	06/786,929	10/28/86
4,619,762	06/731,225	10/28/86
4,619,777	06/491,718	10/28/86
4,619,788	06/788,813	10/28/86
4,619,791	06/435,752	10/28/86
4,619,799	06/756,721	10/28/86
4,619,801	06/614,773	10/28/86
4,619,807	06/685,603	10/28/86
4,619,809	06/480,450	10/28/86
4,619,838	06/780,158	10/28/86
4,619,841	06/417,428	10/28/86
4,619,843	06/643,025	10/28/86
4,619,856	06/737,968	10/28/86
4,619,857	06/602,418	10/28/86
4,619,860	06/750,187	10/28/86
4,619,868	06/521,808	10/28/86
4,619,874	06/641,684	10/28/86
4,619,876	06/719,495	10/28/86
4,619,889	06/573,455	10/28/86
4,619,893	06/700,245	10/28/86
4,619,894	06/722,818	10/28/86
4,619,904	06/665,867	10/28/86
4,619,910	06/741,403	10/28/86
4,619,917	06/793,367	10/28/86
4,619,918	06/794,815	10/28/86
4,619,929	06/590,746	10/28/86
4,619,937	06/687,181	10/28/86
4,619,940	06,658,941	10/28/86
4,619,951	06/778,440	10/28/86
4,619,961	06/686,486	10/28/86
4,619,988	06/749,073	10/28/86
4,619,991	06/409,300	10/28/86
4,619,992	06/710,993	10/28/86
4,620,001	06/649,394	10/28/86
4,620,002	06/407,223	10/28/86
4,620,005	06/787,714	10/28/86
4,620,006	06/407,215	10/28/86
4,620,010	06/594,644	10/28/86
4,620,020	06/719,590	10/28/86
4,620,022	06/757,060	10/28/86
4,620,035	06/310,409	10/28/86
4,620,039	06/742,537	10/28/86

Patent Number	Serial Number	Issue Date
4,620,041	06/784,618	10/28/86
4,620,060	06/714,918	10/28/86
4,620,062	06/659,526	10/28/86
4,620,070	06/698,070	10/28/86
4,620,078	06/664,321	10/28/86
4,620,101	06/678,463	10/28/86
4,620,105	06/588,845	10/28/86
4,620,109	06/730,863	10/28/86
4,620,111	06/624,450	10/28/86
4,620,122	06/759,710	10/28/86
4,620,124	06/684,880	10/28/86
4,620,127	06/705,649	10/28/86
4,620,135	06/545,272	10/28/86
4,620,149	06/423,603	10/28/86
4,620,151	06/563,636	10/28/86
4,620,156	06/663,369	10/28/86
4,620,160	06/682,218	10/28/86
4,620,162	06/651,319	10/28/86
4,620,173	06/738,299	10/28/86
4,620,183	06/579,416	10/28/86
4,620,188	06/408,118	10/28/86
4,620,194	06/548,574	10/28/86
4,620,204	06/785,714	10/28/86
4,620,219	06/637,769	10/28/86
4,620,235	06/653,266	10/28/86
4,620,241	06/511,112	10/28/86
4,620,261	06/659,737	10/28/86
4,620,266	06/609,789	10/28/86
4,620,271	06/753,115	10/28/86
4,620,288	06/545,650	10/28/86
4,620,301	06/562,717	10/28/86
4,620,303	06/644,074	10/28/86
4,620,310	06/710,491	10/28/86
4,620,319	06,709,544	10/28/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1), and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptence Date
4,360,187	06/275,267	11/23/82	6/19/81	10/11/90
4,438,331	06/326,683	3/20/84	12/02/81	11/30/90
4,459,160	06/303,581	7/10/84	9/18/81	11/30/90
4,508,248	06/402,894	4/02/85	7/29/82	9/14/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1,21(b)).

4,411,273, Re. S. N. 07/586,136, Filed Sept. 21, 1990, Cl. 128/731, SYSTEM AND METHOD FOR ELECTRODE PAIR DERIVIATIONS IN ELECTROENCEPHALOGRAPHY, E. Roy John, Owner of Record: *Cadwell Laboratories, Inc., Kennewick, Wash.*, Attorney or Agent: Eliots S. Geber, Ex. Gp.: 339

4,707,095, Re. S. N. 07/593,465, Filed Oct. 3, 1990, Cl. 354, FILM REWINDER, Yoshiyuki Nakano, et al., Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 211

4,772,128, Re. S. N. 07/585,245, Filed Sept. 19, 1990, Cl. 356/384, FIBER OPTIC IMAGING SYSTEM FOR ON-LINE MONITORING, Edmond Vinarub, et al., Owner of Record: *Dolan-Jenner Industries, Inc., Woburn, Mass.*, Attorney or Agent: James M. Smith, Ex. Gp.: 255

4,772,827, Re. S. N. 07/584,742, Filed Sept. 19, 1990, Cl. 315/382, CATHODE RAY TUBE, Kuniharu Osakabe, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Melvin Kraus, Ex. Gp.: 222

4,785,806, Re. S. N. 07/617,491, Filed Nov. 20, 1990, Cl. 128/303.100, LASER ABLATION PROCESS AND APPARATUS, Lawrence I. Deckelbaum, Owner of Record: *Yale University, New Haven, Conn.*, Attorney or Agent: William R. McClellan, Ex. Gp.: 335

4,787,354, Re. S. N. 07/617,087, Filed Nov. 23, 1990, Cl. 123/414, IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH SIMPLIFIED CRANKSHAFT SENSING AND IMPROVED COIL CHARGING, David I. Wilens, et al., Owner of Record: *Electromotive, Inc., Chantilly, Va.*, Attorney or Agent: Robert W. Faris, Ex. Gp.: 342

4,811,735, Re. S. N. 07/615,770, Filed Nov. 19, 1990, Cl. 606/128, STONE DESTROYING CATHETER AND METHOD OF USE, John Nash, et al., Owner of Record: *Kensey Nash Corp., Exton, Pa.*, Attorney or Agent: Martin L. Faigus, Ex. Gp.: 339

4,880,621, Re. S. N. 07/612,438, Filed Nov. 14, 1990, Cl. 424/74, COSMETIC COMPOSITION FOR THE TREATMENT OF THE HAIR AND SKIN COMPRISING A POWDER OF FLOWERS OR FLOWER TOPS AND A COHESION AGENT, Jean-Francois Grollier, et al., Owner of Record: *Societe Anonyme Dite: L'Oreal, Paris, France*, Attorney or Agent: Donald B. Deaver, Ex. Gp.: 152

4,916,819, Re. S. N. 07/616,421, Filed Nov. 21, 1990, Cl. 33/318.1, PROGRESSIVE PLOTTER WITH UNIDIRECTIONAL PAPER MOVEMENT, Heinz J. Geber, Owner of Record: *Geber Garment Technology, Inc., Tolland, Conn.*, Attorney or Agent: Joseph A. Fischetti, Ex. Gp.: 246

4,938,571, Re. S. N. 07/615,037, Filed Nov. 16, 1990, Cl. 350/357, SOLID STATE ELECTROCHROMIC LIGHT MODULATOR, Stuart F. Cogan, et al., Owner of Record: *EIC Laboratories, Inc., Norwood, Mass.*, Attorney or Agent: Charles Heiken, Ex. Gp.: 252

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,133,550, Reexam. No. 90/002,207, Requested Nov. 21, 1990, Cl. 280/210, BICYCLE AND POWER TRANSMISSION SYSTEM, Lawrence G. Brown, Owner of Record: *Inventor, Carson City, Nev.*, Attorney or Agent: Bruce G. Klass, Denver,

Colo., Ex. Gp.: 316, Requester: Shimano Industrial Co., Ltd., Osaka, Japan

4,604,111, Reexm. No. 90/002,209, Requested Nov. 23, 1990, Cl. 055/097, PARTICULATE CONTAMINATION CONTROL METHOD AND FILTRATION DEVICE, Anthony Natale, Owner of Record: *GPAC Inc., Pennsauken, N. J.*, Attorney or Agent: Fleit, Jacobson, Cohn, Price, et al.,. Washington, D. C., Ex. Gp.: 135, Requester: Jimmy W. Simpson, Sr., Trilby, Fla.

4,808,413, Reexam. No. 90/002,213, Requested: Nov. 28, 1990, Cl. 424/458, PHARMACEUTICAL COMPOSITIONS IN THE FORM OF BEADLETS AND METHOD, Yatinda M. Joshi, Owner of Record: *E. R. Squibb & Co., Princeton. N. J.*, Attorney or Agent: Burton Rodney, Princeton, N. J. Ex. Gp.: 139, Requester: Owner

4,837,586, Reexam. No. 90/002,212, Requested Nov. 27, 1990, Cl. 346/76.0PH, IMAGE CONTRAST BY THERMAL PRINTERS, Scott A. Brownstein, Owner of Record: *Eastman Kodak Co., Rochester, N. Y.*, Attorney or Agent: John D. Husser, Eastman Kodak, Rochester, N. Y., Ex. Gp.: 216, Requester: Stuart Lubitz, Spensley, Horn, Jubas & Lubitz, Los Angeles, Calif.

4,883,657, Reexam. No. 90/002,208, Requested Nov. 20, 1990, Cl. 424/072, REARRANGER PROCESS AND COMPOSITION FOR PERMANENT WAVING PROCESS, Barry W. Williams, et al., Owner of Record: *Amethyst Investment Group, Inc., Chicago, Ill.*, Attorney or Agent: Allegretti & Witcoff, Inc., Chicago, Ill., Ex. Gp.: 152, Requester: Bristol-Myers Squibb Co., New York, N. Y.

Patent Terms Extended Under 35 USC 156

Certificates extending the terms of the following patents were issued on December 7, 1990.

U.S. Patent No. 3,842,061, granted Oct. 15, 1974, to Lars-Olof Andersson et al, Owner of Record: *KabiVitrum AB*, Title: METHOD FOR ISOLATION OF ANTITHROMBIN FROM ANIMAL TISSUE MATERIALS BY ADSORPTION ON SULFATED CARBOHYDRATE GEL, Classification: 530/393, Product Trade Name: ATnativ, Term Extended: 5 years.

U.S. Patent No. 3,911,138, Granted Oct. 7, 1975, to Leland C. Clark, Jr., Owner of Record: *Children's Hospital Medical Center of Cincinnati, Ohio*, Title: ARTIFICIAL BLOOD AND METHOD FOR SUPPORTING OXYGEN TRANSPORT IN ANIMALS, Classification: 514/746, Product Trade Name: Fluosol, Term Extended: 2 years.

U.S. Patent No. 4,001,331, Granted Jan. 4, 1977, to Meier E. Freed, et al, Owner of Record: *American Home Products Corp.*, Title: BENZOBICYCLOALKANE, Classification: 564/427, Product Trade Name: Dalgan, Term Extended: 2 years.

U.S. Patent No. 4,089,969, Granted May 16, 1978, to Joseph M. Muchowski et al., Owner of Record: *Syntex (U.S.A.) Inc.*, Title: 5-AROYL-1, 2-DIHYDRO-3H-PYRROLO[1,2-a]PYRROLE-1-CARBOXYLIC ACID DERIVATIVES AND PROCESS FOR THE PRODUCTION THEREOF, Classification: 514/416, Product Trade Name: Toradol, Term Extended: 2 years.

U.S. Patent No. 4,100,274, Granted July 11, 1978, to Anand Swaroop Dutta et al, Owner of Record: *Imperial Chemical Industries PLC*, Title: POLYPEPTIDE, Classification: 514/15, Product Trade Name: Zoladex, Term Extended: 2 years.

U.S. Patent No. 4,105,783, Granted Aug. 8, 1978, to Ruey J. Yu et al, Owner of Record: *Westwood Pharmaceuticals Inc.*, Title: THERAPEUTIC TREATMENT OF DRY SKIN, Classification: 514/549, Product Trade Name: Lac-Hydrin, Term Extended: 541 days.

U.S. Patent No. 4,239,747, Granted Dec. 16, 1980, to Heinrich Pfeiffer et al, Owner of Record: *Schering Aktiengesellschaft*, Title: DICARBOXYLIC ACID BIS (3,5-DICARBAMOYL-2,4,6-TRIIODOANILIDES) USEFUL AS X-RAY CONTRAST AGENTS, Classification: 424/5, Product Trade Name: Osmovist, Term Extended: 2 years.

U.S. Patent No. 4,297,488, Granted Oct. 27, 1981, to Burton G. Christensen et al., Owner of Record: *Merck & Co., Inc.*, Title: 7-ALPHA-METHOXY CEPHALOSPORINS, Classification: 540/221, Product Trade Name: Zefazone, Term Extended: 2 years.

U.S. Patent No. 4,400,358, Granted Aug. 23, 1983, to Rudi D. Neirinckx, Owner of Record: *E.R. Squibb & Sons, Inc.*, Title: METHOD AND ADSORBANT COMPOSITION FOR ^{82}RB GENERATION, Classification: 423/2, Product Trade Name: Cardiogen-82, Term Extended: 2 years.

U.S. Patent No. 4,443,466, Granted Apr. 17, 1984, to Arto J. Karjalainen et al, Owner of Record: *Farmos-Yhtyma Oy (Farmos Group Ltd.)*, Title: 4-BENZYL-AND 4 BENZOYL-SUBSTITUTED IMIDAZOLE DERIVATIVES AND USE AS MEDICAMENTS, Classification: 514/396, Product Trade Name: Dormosedan, Term Extended: 954 days.

U.S. Patent No. 4,452,745, Granted June 5, 1984, to William B. Lacefield et al, Owner of Record: *Eli Lilly and Company*, Title: 9-AMINOALKYLFLOURENES, Classification: 558/427, Product Trade Name: Decabid, Term Extended: 2 years.

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thiry days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Primary Care Corp., Falls Church, Va., Reg. No. 1,359,786, for the mark "PRIMECARE", Canc. No. 19,185.

The Outlet Company, Providence R.I., Reg. No. 556,811, for the mark "MONTCLAIR", Canc. No. 19,217.

TMC United Industries, Inc., Pinellas Park, Fla., Reg. No. 1,118,510, for the mark "UNITED FURNITURE SALES", Canc. No. 19,256.

JEAN BROWN
Administrator of the Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Patents Available for License or Sale

4,313,502 ROCK EXTRACTOR APPARATUS AND METHOD, P. Carvellas, 413 N. Washington St., Alexandria, Va. 22314

4,659,250 IMPROVED PAVEMENT EXTRACTOR, P. Carvellas, 413 N. Washington St., Alexandria, Va. 22314

4,702,704 TETRAHEDRAL CODON STEREO TABLE, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, P.O. Box 747, Falls Church, Va. 22046

4,829,909 MATERIAL TRANSPORT ARRANGEMENT, Ronald L. Mandel, 9115 Old State Rd., Evansville, Ind. 47711

4,925,287 MIRROR ASSEMBLY FOR FACILITATING TRAILER HITCH ALINGMENT, Barbara Lord, Thomas Keightley, 6440 Center St. N. E., Calgary, Alberta, Canada T2K5C5

4,956,915 SANITARY NAIL CLIPPING DEVICE, Charles A. Anderson, 2402 108th N.E., Norman, Okla. 73071

4,971,865 ADJUSTABLE ANTLER HANGER BRACKET, Philiys R. Nowlan, P.O. Box 86, Buctouche, New Brunswick, Canada, E0A 1G0

4,976,451 HUMAN POWERED VEHICLE, Kamen G. Kamenov, 244 4th Ave., San Francisco, Calif. 94118

DES. 255,620 WELDING CABLE, Louis D. Innocenzi, Suite 211, Lawrence Commons, 3371 Rte. 1, Lawrenceville, N.J. 80648

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from October through December 1990. Information includes:

- subclasses established or abolished
- subclass title, indent, or position change
- classes where existing subclass definitions have changed

This Reclassification Alert Report may appear from time to time in the Official Gazette and is intended to provide an interim notice of classification and changes pending publication of the Manual of Classification and revisions thereto.

Nov. 30, 1990

WILLIAM S. LAWSON
Administrator for Documentation

Class	First Subclass	Last Subclass	Action	Order Number
005			Defn Change	1359
007			Defn Change	1361
008			Defn Change	1355
008			Defn Change	1361
015			Defn Change	1361
017			Defn Change	1355
017	001	076	Abolish	1361
024			Defn Change	1361
029			Defn Change	1361
030			Defn Change	1361
034			Defn Change	1355
034			Defn Change	1356
034			Defn Change	1361
037			Defn Change	1355
043			Defn Change	1361
044	003.1	003.8	Abolish	1355
044	007.1	007.4	Abolish	1355
044	007.5	007.7	Abolish	1355
044	011	033	Abolish	1355
044	042	048	Abolish	1355
044	050	079	Abolish	1355
044	090		Abolish	1355
044	250	253	Establish	1355
044	265	272	Establish	1355
044	275		Establish	1355
044	280	282	Establish	1355
044	300	459	Establish	1355
044	490	492	Establish	1355
044	507	512	Establish	1355
044	530		Establish	1355
044	551	580	Establish	1355
044	630	636	Establish	1355
044	643		Establish	1355
044	D001	D004	Abolish	1355
051			Defn Change	1355
053			Defn Change	1355
053			Defn Change	1361
060			Defn Change	1355
069			Defn Change	1361
073			Defn Change	1356
075			Defn Change	1355
081			Defn Change	1361
083			Defn Change	1361
099			Defn Change	1356
099			Defn Change	1361
100			Defn Change	1355
100			Defn Change	1361
102			Defn Change	1355
106			Defn Change	1355
106			Defn Change	1361
110			Defn Change	1361
118			Defn Change	1361
119			Defn Change	1361
119	001		Abolish	1359

119	006.5	006.8	Establish	1359
119	028.5		Establish	1359
119	050.7		Establish	1359
119	069.5		Establish	1359
119	161	174	Establish	1359
122			Defn Change	1356
123			Defn Change	1356
126			Defn Change	1356
126			Defn Change	1355
128			Defn Change	1356
128			Defn Change	1361
131			Defn Change	1355
134			Defn Change	1355
134			Defn Change	1361
137			Defn Change	1356
138			Defn Change	1361
141			Defn Change	1361
149			Defn Change	1355
150			Defn Change	1356
156			Defn Change	1355
164			Defn Change	1355
166			Defn Change	1356
172			Defn Change	1361
175			Defn Change	1356
180			Defn Change	1356
186			Defn Change	1361
196			Defn Change	1356
198			Defn Change	1361
201			Defn Change	1355
202			Defn Change	1355
206			Defn Change	1355
208			Defn Change	1355
210			Defn Change	1355
210	927		Abolish	1357
210	930		Establish	1357
211			Defn Change	1361
212			Defn Change	1361
219			Defn Change	1355
219			Defn Change	1361
219	271	382	Abolish	1356
220	004.04	004.09	Establish	1363
220	004.11	004.17	Establish	1363
220	005		Abolish	1363
221			Defn Change	1355
222			Defn Change	1361
223			Defn Change	1355
225			Defn Change	1361
241			Defn Change	1355
241			Defn Change	1361
248			Defn Change	1361
249			Defn Change	1355
249			Defn Change	1361
250			Defn Change	1356
252			Defn Change	1355
252	386		Abolish	1355
254			Defn Change	1361
261			Defn Change	1356
269			Defn Change	1361
294			Defn Change	1359
294	079		Abolish	1361
294	080		Abolish	1361
313			Defn Change	1356
324			Defn Change	1360
337			Defn Change	1356
354			Defn Change	1356
356			Defn Change	1356
356			Defn Change	1359
362			Defn Change	1356
366			Defn Change	1356
373			Defn Change	1356
388	802		Abolish	1360
388	810		Abolish	1360
388	817		Abolish	1360
388	818		Abolish	1360
388	845		Abolish	1360
388	846		Abolish	1360
388	900		Title Change	1360
388	907		Title Change	1360
388	907.2		Establish	1360

388	907.5		Establish	1360
388	928.1		Establish	1360
392	301	503	Establish	1356
414			Defn Change	1361
420	584		Abolish	1357
420	584.1		Establish	1357
420	586.1		Establish	1357
424			Defn Change	1355
424			Defn Change	1358
424			Defn Change	1361
424			Defn Change	1362
425			Defn Change	1355
425			Defn Change	1361
426			Defn Change	1355
426			Defn Change	1358
426			Defn Change	1361
428			Defn Change	1355
430			Defn Change	1355
431			Defn Change	1355
431			Defn Change	1356
432			Defn Change	1361
432			Defn Change	1356
435			Defn Change	1358
435	007		Abolish	1362
435	007.1		Establish	1362
435	007.2		Establish	1362
435	007.21	007.25	Establish	1362
435	007.3	007.37	Establish	1362
435	007.4	007.7	Establish	1362
435	007.71		Establish	1362
435	007.72		Establish	1362
435	007.8		Establish	1362
435	007.9		Establish	1362
435	007.91	007.95	Establish	1362
435	235		Abolish	1362
435	235.1		Establish	1362
435	317.1		Title Change	1362
435	320		Abolish	1362
435	320.1		Establish	1362
452	001	198	Establish	1361
493			Defn Change	1361
502			Defn Change	1359
514			Defn Change	1358
530			Defn Change	1358
585			Defn Change	1355
930	010		Establish	1358
930	020	025	Establish	1358
930	030		Establish	1358
930	031		Establish	1358
930	040		Establish	1358
930	050		Establish	1358
930	060		Establish	1358
930	070		Establish	1358
930	080		Establish	1358
930	090		Establish	1358
930	100		Establish	1358
930	110		Establish	1358
930	120		Establish	1358
930	130		Establish	1358
930	140	145	Establish	1358
930	150		Establish	1358
930	160		Establish	1358
930	170		Establish	1358
930	180		Establish	1358
930	190		Establish	1358
930	200		Establish	1358
930	210		Establish	1358
930	220	224	Establish	1358
930	230		Establish	1358
930	240		Establish	1358
930	250		Establish	1358
930	260		Establish	1358
930	270		Establish	1358
930	280		Establish	1358
930	290		Establish	1358
930	300		Establish	1358
930	310		Establish	1358
930	320		Establish	1358
930	D500		Establish	1358

930	D510		Establish	1358
930	D520		Establish	1358
930	D530		Establish	1358
930	D532	D539	Establish	1358
930	D541	D560	Establish	1358
930	D565	D567	Establish	1358
930	D570	D572	Establish	1358
930	D580	D582	Establish	1358
930	D590	D592	Establish	1358
930	D600	D602	Establish	1358
930	D610	D612	Establish	1358
930	D620	D622	Establish	1358
930	D630	D632	Establish	1358
930	D640	D642	Establish	1358
930	D650	D652	Establish	1358
930	D660	D662	Establish	1358
930	D670	D672	Establish	1358
930	D680	D682	Establish	1358
930	D690	D698	Establish	1358
930	D700	D710	Establish	1358
930	D720	D722	Establish	1358
930	D730	D732	Establish	1358
930	D740	D742	Establish	1358
930	D750	D752	Establish	1358
930	D760	D762	Establish	1358
930	D770	D772	Establish	1358
930	D780	D790	Establish	1358
930	D800	D803	Establish	1358
930	D810	D812	Establish	1358
930	D820	D822	Establish	1358
935			Defn Change	1362

PATENT NOTICES

Certificates of Correction For Week of January 8, 1991

D. 297,811	4,853,368	4,881,283	4,894,080
D. 301,491	4,853,706	4,881,921	4,894,404
Pp. 7,068	4,856,157	4,882,094	4,894,528
4,512,952	4,857,474	4,882,121	4,894,933
4,514,574	4,858,749	4,882,871	4,895,580
4,585,589	4,860,406	4,882,967	4,895,620
4,594,187	4,861,084	4,883,508	4,896,245
4,594,348	4,861,873	4,883,822	4,896,403
4,665,220	4,861,934	4,883,832	4,896,867
4,738,511	4,862,337	4,884,268	4,896,897
4,743,356	4,862,609	4,885,669	4,896,899
4,752,923	4,863,435	4,886,111	4,896,991
4,757,468	4,864,575	4,886,414	4,897,008
4,775,624	4,864,991	4,887,000	4,897,051
4,785,415	4,865,652	4,887,712	4,897,058
4,796,210	4,866,860	4,888,587	4,897,063
4,801,540	4,867,210	4,889,216	4,897,231
4,804,534	4,867,269	4,889,399	4,897,854
4,815,247	4,867,938	4,889,450	4,898,568
4,817,881	4,868,298	4,889,638	4,898,714
4,821,825	4,868,393	4,889,640	4,899,483
4,826,872	4,868,904	4,890,155	4,899,722
4,827,907	4,869,074	4,890,210	4,900,130
4,828,164	4,870,175	4,890,223	4,900,173
4,838,742	4,870,874	4,890,228	4,900,287
4,843,055	4,871,751	4,890,442	4,900,360
4,844,441	4,874,756	4,891,018	4,900,454
4,845,846	4,876,072	4,891,343	4,901,579
4,847,071	4,876,803	4,892,114	4,902,165
4,847,076	4,877,562	4,892,186	4,902,213
4,848,093	4,877,717	4,892,512	4,903,220
4,849,179	4,877,873	4,892,711	4,905,151
4,849,424	4,878,286	4,892,744	4,906,060
4,850,310	4,878,416	4,892,784	4,906,478
4,850,336	4,879,406	4,892,855	4,906,774
4,850,642	4,879,692	4,893,308	4,923,903
4,851,406	4,880,568	4,893,399	4,947,620
4,852,407	4,881,177	4,893,821	4,949,976

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PATENT APPLICATION	New patent application and associated papers and fees.
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California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
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	Pittsburgh, Carnegie Library of	(412) 622-3138
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 1, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-15-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	11-21-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP – 130 BARRY S. RICHMAN, Director	2-27-89
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-31-89
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	12-18-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	11-2-88
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	7-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	5-18-89
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	2-27-89
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	1-2-89
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	6-16-87
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	12-7-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-10-89
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	7-24-89
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	5-31-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	10-1-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

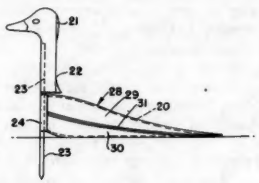
Patents	Numbers 3,775,774 to 3,778,913 inclusive
Plant Patents	none

REEXAMINATIONS

JANUARY 8, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 4,062,141 (1400th)
DECOY
Jelmer B. Shjeflo, Bismarck, N. Dak., assignor to Margaret M. Jurgens and George W. Jurgens
Reexamination Request No. 90/001,987, Apr. 9, 1990.
Reexamination Certificate for Patent No. 4,062,141, issued Dec. 13, 1977, Ser. No. 736,148, Oct. 27, 1976.
Reexamination Certificate B1 4,062,141, issued Aug. 4, 1987.
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—3



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1** is confirmed.

1. A decoy comprising a head portion having a neck portion therebeneath and made of relatively rigid material, a hoop member attached to the bottom of the neck portion and extending downward therefrom, a spike attached to the bottom of the hoop and projecting downward therefrom, said spike being adapted to be inserted into the ground, said head and neck portions simulating the head of a water fowl, a flexible bag having a wind sock construction with an opening at the front end with the edges of the bag adjacent the opening fixed to the hoop to keep and maintain the opening in an open condition, the bag having flared out center portions, a tapered rearward portion, whereby when the decoy is positioned so that the opening in the bag is facing into the wind, the wind will inflate the bag so that the bag will give the appearance of the body of a water fowl with the flared out center portions giving the appearance of the folded wings of the decoy, and the tapered rearward portion giving the appearance of the tail of the water fowl.

B1 4,491,005 (1401st)
ROLLING MILL
Tomoaki Kimura, Hitachi, and Keiji Miyakozawa, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Reexamination Request No. 90/001,851, Sep. 27, 1989.
Reexamination Certificate for Patent No. 4,491,005, issued Jan. 1, 1985, Ser. No. 384,557, Jun. 3, 1982.
Claims priority, application Japan, Jun. 3, 1981, 56-86241
Int. Cl.[5] B21B *27/10, 31/18, 29/00*
U.S. Cl. 72—201

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

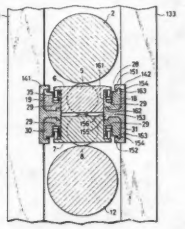
The patentability of claims **10–12** is confirmed.

Claim **6** is cancelled.

Claims **1, 2, 5, 7, 8, 9, 13, 14** and **15** are determined to be patentable as amended.

Claims **3, 4** and **16**, dependent on an amended claim, are determined to be patentable.

1. A rolling mill comprising:
a roll housing;
a pair of working rolls provided with metal chocks at the ends and brought into contact with a material to be rolled;
a pair of backup rolls, mounted on said roll housing by metal chocks provided at the ends for supporting the said respective working rolls;
a plurality of *independent* beams extending along the axes of said working rolls and disposed *on opposite sides of each of said working rolls* in juxtaposition with said working rolls, *respectively*;
a plurality of supports mounted on said roll housing at portions facing said metal chock for said working rolls for axially slidably supporting said [beam] *beams*, each of said supports having a central projection projecting horizontally toward said working rolls and mounting thereon



said beams *and upper and lower projections spaced vertically from said central projection*, said central projection having upper and lower [projections] *projecting portions* at the end facing said metal chock *and each of said upper and lower projections having recesses such that said projecting portions and said recesses engage parts of said beams* for restricting horizontal movement of said [beam] *beams*;
a plurality of roll benders, provided on said beams [within regions] *and positioned wholly within a horizontally extending width* of said central projection and said roll benders being engaged with parts of said metal chocks of said working rolls, said roll benders being disposed on said beams symmetrically with respect to said central projections so that forces applied to said beams by said benders are canceled through said central projections; and
a plurality of independent [actuators] *actuator cylinders* disposed *axially in parallel to and* in [adjacent relation] *juxtaposition* with said beams, and connected to said housing and *directly to* said beams, at the side portions where driving means for said working rolls are disposed, for moving said beams in the axial direction, respectively, whereby said working rolls are moved axially through axial movement of said beams by said actuators.

B1 4,510,479 (1402nd)

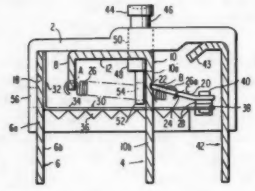
PC-BOARD MOUNTED THERMAL BREAKER

Donald K. Merchant, Cambridge, Md., assignor to Airpax Corp., Cambridge, Md.

Reexamination Request No. 90/001,875, Oct. 31, 1989.
Reexamination Certificate for Patent No. 4,510,479, issued Apr. 9, 1985, Ser. No. 550,462, Nov. 10, 1983.
Continuation-in-part of Ser. No. 480,285, Mar. 30, 1983, abandoned.

Int. Cl.[5] H01H *61/00, 71/16*

U.S. Cl. 337—91



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–28 is confirmed.

1. A circuit breaker, comprising:

an electrically insulated housing;

first, second, and third terminal means extending through the housing, wherein said first terminal is connected to a first electrical circuit and said second terminal is connected to a second electrical circuit;

a first bimetallic element located in said housing and electrically coupled to said first terminal;

a first contact member coupled to said first bimetallic element;

a second bimetallic element located in said housing and electrically coupled to said second terminal;

a second contact member coupled to said second bimetallic element;

a third contact member located in said housing and electrically coupled to said third terminal;

means mounting said third contact member for movement alternately into and out of contact with said first and second contact members, respectively; and

means biasing said third contact member substantially through the center of movement of said third contact member to alternately bias said third contact member in opposite pivotal directions between first and second positions, wherein in said first position, said third contact member is biased into electrical contact with said first contact member, and in said second position, said third contact member is biased into electrical contact with said second contact member;

said first bimetallic element being deformed upon application of a sufficient overcurrent therethrough against the action of said biasing means to move said third contact member from said first position toward said second position; and

said second bimetallic element being deformed upon application of a sufficient overcurrent therethrough against the action of said biasing means to move said third contact member from said second position toward said first position.

REISSUES

JANUARY 8, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

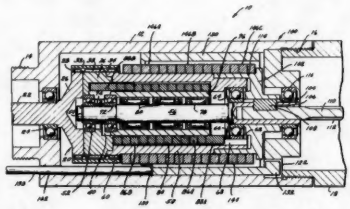
Re. 33,514
ADJUSTABLE TORQUE LIMITING ASSEMBLY

Donald A. Ciolli, University Heights, Ohio, assignor to American Assembly Tools, Inc., Cleveland, Ohio

Original No. 4,610,339, dated Sep. 9, 1986, Ser. No. 790,789, Oct. 24, 1985. Continuation of Ser. No. 568,773, Jan. 6, 1984, abandoned. Application for reissue Oct. 2, 1987, Ser. No. 104,004

Int. Cl.[5] F16D *43/21, 13/08*

U.S. Cl. 192—48.92 **40 Claims**



1. An adjustable torque limiting assembly comprising, in combination, a first wrap spring having a pair of ends, an input member having means for receiving said pair of ends of said wrap spring, means associated with said input member for adjusting the [relative] angular position of one of said pair of ends relative to the other of said pair of ends, an output member disposed within said first wrap spring, said output member having a cylindrical portion engaged by at least *a* portion of said first wrap spring, a second wrap spring disposed about portions of said input member and said output member and a member having a cylindrical opening disposed about said second wrap spring.

Re. 33,515
GRAVITY FEED DISPLAY DEVICE

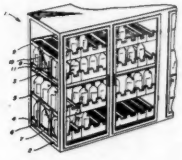
Jane S. Fershko, Toronto, Canada, and Robert W. Lackey, Hickory, N.C., assignors to The Mead Corporation, Dayton, Ohio

Original No. 4,690,287, dated Sep. 1, 1987, Ser. No. 853,938, Apr. 21, 1986. Continuation of Ser. No. 557,851, Dec. 5, 1983, Pat. No. 4,593,823. Application for reissue Aug. 29, 1989, Ser. No. 400,149

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—49.1 **4 Claims**

4. A gravity feed shelf unit comprising a main chute structure having side walls and arranged to be inclined so as to feed articles in the direction of inclination thereof, supplementary chute structure including a plurality of supplementary chutes disposed along at least one side of said main chute structure and similarly inclined so as to feed articles in the direction of inclination thereof, each of said supplementary chute structures including a slide plate, an end wall at the front and rear thereof and an outer side wall, a side wall of said main chute structure constituting the inner wall of the adjacent supplementary chute structure, and the outer side wall of a supplementary chute structure forming the inner side wall of an adjacent supplementary chute structure, and the slide plates of outer ones of said supplementary chute structures being interconnected with adjacent parts of the adjacent inner supplementary chute structure and the inner one of said supplementary chute structures being interconnected with the adjacent side of said main chute structure by weakened severance means, and frangible



means interconnecting an end wall of each outer supplementary chute structure with the adjacent side wall of an adjacent inner supplementary chute structure and interconnecting a side wall of said main chute structure and an end wall of the adjacent supplementary chute structure.

Re. 33,517
THERMOSENSITIVE RECORDING LABEL

Tomoo Shibata, Irvine, and Wissam J. Jurdi, Tustin, both of Calif., assignors to Ricoh Electronics, Inc., Santa Ana, Calif.

Original No. 4,577,204, dated Mar. 18, 1986, Ser. No. 614,287, May 25, 1984. Application for reissue Mar. 18, 1988, Ser. No. 169,846

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—200 **21 Claims**

13. A thermosensitive recording label comprising:

a substrate;

a thermosensitive color-forming layer disposed on one side of said substrate, said thermosensitive color-forming layer comprising a colorless or light-colored leuco dye and acidic substance capable of causing said leuco dye to undergo color formation upon heating of the thermosensitive recording label;

a pressure-sensitive hot melt adhesive layer disposed on another side of said substrate, said pressure-sensitive hot melt adhesive layer comprising at least one adhesive agent selected from the group consisting of a styrene-butadiene rubber hot melt adhesive and an acrylic hot melt adhesive, and,

a releasable backing sheet disposed on said pressure-sensitive adhesive layer.

PLANT PATENTS

GRANTED JANUARY 8, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,414

MINIATURE ROSE PLANT NAMED RUIFARO

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to De Ruiter's Nieuwe Rozen B.V., Hazerswoude, Netherlands

Filed Aug. 11, 1989, Ser. No. 392,579
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by a plant suitable for growing in pots and outdoor in gardens and by attractive medium pink flowers which are long lasting on the plant.

7,415

MINIATURE ROSE PLANT NAMED INTERELF

G. P. Ilsink, Leersum, Netherlands, assignor to Interplant B.V., Leersum, Netherlands

Filed Aug. 11, 1989, Ser. No. 392,567
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by a plant suitable for growing in pots and by attractive light pink flowers which are long lasting on the plant.

7,416

AZALEA HYBRID 'RACHEL BANDY'

Rose M. Mossholder, Fallbrook, Calif., assignor to Hines Nurseries Inc., Irvine, Calif.

Filed May 15, 1989, Ser. No. 351,492
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of evergreen azalea as described and illustrated, characterized by a compact, vigorous horizontally spreading form and a prolific blooming habit with flowers that appear in clusters of two to four, very large semi-double blooms with a diameter of about 10 to 11.4 cm, and a magenta-rose color with the two upper wing petals dotted, and a mildly sweet fragrance.

7,417

MINIATURE ROSE PLANT DOHHAWK

Donald Hardgrove, El Cajon, Calif., assignor to NOR'EAST Miniature Roses, Inc., Rowley, Mass.

Filed Aug. 10, 1989, Ser. No. 391,480
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by attractive dark red flowers of good form which are long lasting on the plant and after cutting.

PATENTS

GRANTED JAN. 8, 1991

ERRATA

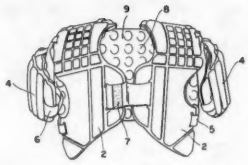
For CLASS	See PATENT NO.
063-002	4,982,580
063-029	4,982,581
228-004	4,982,728
164-467	4,982,796
108-051	4,982,859
277-027	4,982,889
083-039	4,983,081
606-194	4,983,167
424-047	4,983,418
435-172	4,983,542
562-623	4,983,567
552-630	4,983,646
524-436	4,983,742
392-407	4,983,809
250-492	4,983,864
358-213	4,984,002
380-039	4,984,219

PATENTS

GRANTED JANUARY 8, 1991

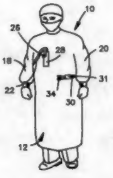
GENERAL AND MECHANICAL

4,982,447
BODY PROTECTOR
Anthony E. Henson, Harbord, Australia, assignor to Albion Hat & Cap Company Pty. Ltd., Chippendale, Australia
Filed May 8, 1989, Ser. No. 348,813
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 **7 Claims**



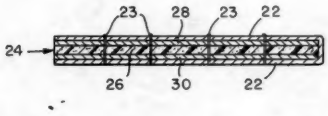
1. A set of shoulder pads for a sportsman, said set of pads comprising a back plate and two breast plates hingedly connected together, and a pair of shoulder plates hingedly connected to the remainder of said set of shoulder pads, wherein each of said plates is integrally formed and moulded from plastics material, and each of said plates has an inner surface having a plurality of protrusions thereon, each of said protrusions being filled with said plastics material and the spaces between adjacent protrusions providing paths through which air is able to pass between said inner surface and the skin of said sportsman.

4,982,448
SURGICAL GOWN WITH TRANSFER CARD
Walter Kogut, Asheville, N.C., assignor to Work Wear Corporation, Inc., Asheville, N.C.
Filed Apr. 6, 1989, Ser. No. 334,686
Int. Cl.[5] A41D *13/12, 13/00*
U.S. Cl. 2—51 **6 Claims**



1. A surgical gown comprising a gown proper having a pair of sleeves, a front, a pair of side margins defining an open back for the gown, a first tie-string having one end secured to the gown and the other end releasably attached to a transfer card, a second tie-string having one end secured to the gown, and transfer card mounting means for adhesively but releasably securing said transfer card directly to the front of said gown, said transfer card mounting means including means defining a dry-peel interface between the transfer card and the area of the gown on which the card is releasably secured.

4,982,449
BACKING FOR FLEXIBLE MATERIALS ON CAP BRIMS OR THE LIKE
Harvey Finkelstein, Highland Mills, N.Y., assignor to Tri-Seal International, Inc., Blauvelt, N.Y.
Filed Nov. 27, 1989, Ser. No. 441,473
Int. Cl.[5] A42B *1/02, 1/04*
U.S. Cl. 2—192 **6 Claims**

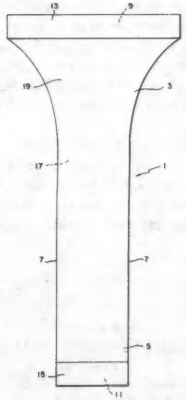


1. In a backing for outer fabric layers of a cap brim, wherein the outer fabric layers are stitched to the backing, the improvement wherein the backing comprises:

a. middle layer of foamed thermoplastic material; and

b. outer layers of solid thermoplastic material bonded to both sides of said middle foamed layer, said outer solid layers serving as wipers to prevent the breaking off of pieces of said middle layer when the outer fabric layers are stitched to the backing.

4,982,450
PROTECTIVE DEVICE
Dominique D'Huissier, 1, Place des Augustins, 1205 Geneva, Switzerland
Continuation-in-part of Ser. No. 38,532, Apr. 14, 1987. This application Jun. 21, 1989, Ser. No. 369,131
Claims priority, application Switzerland, May 1, 1986, 01795/86
Int. Cl.[5] A41B *9/00, 9/12*
U.S. Cl. 2—402 **10 Claims**



1. A device for protecting garments that are being tried on, the device comprising a thin flexible sheet adapted to be worn temporarily against the skin of the user, pressure-sensitive adhesive at opposite ends or one side of the sheet to hold the sheet temporarily to the skin of the user, the sheet being a composite comprised of an imperforate liquid impervious sheet of polyolefin about 3 to 15μ in thickness and having bonded thereto on the same side as the adhesive and over substantially all the area of the sheet a hydrophilic web of fibers having a

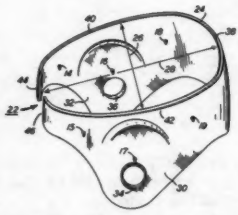
diameter of about 5 to 20μ selected from the group consisting of polypropylene and polyester, said web having a weight of about 10 to 30 g/m^2.

4,982,451

HEAD COVERING DEVICE

Richard T. Graham, 15 Maple Grove Dr., Rochester, N.Y. 14428

Filed Feb. 10, 1989, Ser. No. 309,393
Int. Cl.^{5} A42B *1/06*
U.S. Cl. 2—410 **12 Claims**



1. A head-covering device comprising a resilient, adjustable liner, a deformable fabric crown removably attached thereto, and means for removably attaching said deformable fabric crown to said liner, wherein:

(a) said liner is comprised of an outside surface and an inside surface and is a single strip of flexible, resilient plastic which is substantially U-shaped and which is comprised of a spaced crown, a right arm and a left arm integrally joined to each other, an integrally-formed downwardly-extending cheek piece attached to each of said right and left arms, and a slot separating each of said right and left arms, wherein:

1. said liner has a uniform thickness of from about 0.032 to about 0.375 inches,

2. the internal side-to-side width of said liner is from about 4 to about 9 inches, the internal end-to-end length of said liner is from about 6 to about 11 inches, and the ratio of the internal length to the internal width of the liner is from about 1.1 to about 2.0, and

3. the width of said slot separating said right and said left arm of said liner is from about 0.125 to about 1.5 inches; and

(b) said deformable fabric crown consists essentially of a knit fabric which fabric consists essentially of acrylic fiber; and

(c) said deformable fabric crown is contiguous with both said outside surface and said inside surface of said liner and completely covers said outside surface and said inside surface.

4,982,452

SAFETY HELMET PROVIDED WITH AN INTERLOCK SIGNAL

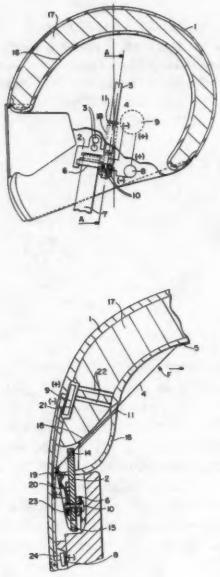
Francois Chaise, Grandvaux, Palinges, F-71430, France

PCT No. PCT/FR88/00017, § 371 Date Sep. 29, 1988, § 102(e) Date Sep. 29, 1988, PCT Pub. No. WO88/05637, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 8, 1988, Ser. No. 269,736
Claims priority, application France, Jan. 29, 1987, 87 01221
Int. Cl.^{5} A42B *7/00, 3/02*
U.S. Cl. 2—421 **10 Claims**

1. A safety helmet provided with an interlock signal, comprising:

a sensor that detects when said safety helmet has been placed on a user's head;

means for fastening said safety helmet to the user's head; and



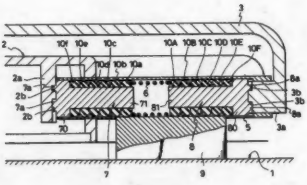
means for indicating whether said means for fastening is properly secured.

4,982,453

MECHANISM FOR SUPPORTING TOILET BOWL COVERING MEMBERS

Osamu Matsumoto, Tokoname, Japan, assignor to Inax Corporation, Tokoname, Japan

Filed Mar. 27, 1990, Ser. No. 499,687
Claims priority, application Japan, Apr. 13, 1989, 1-43597[U]
Int. Cl.^{5} E05F *5/04*
U.S. Cl. 4—248 **9 Claims**



1. A mechanism mounted on a toilet bowl having an upper rim defining an upper horizontal surface and pivotally supporting at least one toilet bowl covering member in a manner to allow slow rotation of the same, said mechanism comprising:

a cylinder on the toilet bowl and extending in a parallel direction to said horizontal surface,

a plurality of elastomeric rings having outer and inner peripheral surfaces and being coaxially fitted within said cylinder:

at least one lock plate fitted within said plurality of rings, and having side edges; and

a boss extending from an edge of said at least one covering member and connected to said lock plate:

each of said plurality of rings including, at the outer peripheral surface thereof, at least one arcuate portion having first and second ends held in sliding contact with an inner peripheral surface of said cylinder, and a first step formed in said outer periphery at said second end, said at least one arcuate portion extending from said first step to said first end to form an outer recess, said recess tapering from said first step toward said first end of said arcuate portion;

each of said plurality of rings including, at the inner peripheral surface thereof, inner recesses each having two second steps at opposite ends thereof, said side edges of the lock plate being fitted within said inner recesses and engageable with said second steps: and

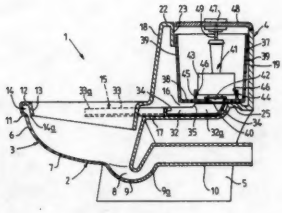
said inner recesses of said plurality of rings having different arcuate lengths, whereby when said at least one covering member is in a vertical position, said side edges of said lock plate are in engagement with one of said second steps in each ring and as said covering member is rotated to a horizontal position, said lock plate is moved away from said ones of said second steps and then brought into engagement with the other second step in said respective rings, successively from the shortest arcuate length of the inner recess to the longest arcuate length of the inner recess, said rings being rotated in the direction in which said outer recess at the outer periphery thereof is tapered.

4,982,454

TOILET SYSTEM COMPRISING A TOILET BOWL ASSOCIATED WITH A WATER FLUSH TANK

Claude Saltel, and Daniel Petit, both of Revin, France, assignors to Etablissements Porcher, Paris, France

Filed May 26, 1989, Ser. No. 357,732
Claims priority, application France, May 26, 1988, 88 07010
Int. Cl.[5] E03D 5/00
U.S. Cl. 4—300 **10 Claims**



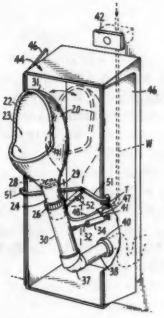
1. A toilet system comprising a toilet bowl associated with a water flush tank, said system being molded in a single ceramic piece, said bowl including an upper edge having an inverted channel surrounding an opening of said bowl and facing an interior surface of said bowl, a supply conduit communicating said tank with said inverted channel, a distributor device having one portion inserted in said supply conduit and another portion disposed in said channel for facilitating the flow of liquid from said tank throughout said channel, said tank having an open top and a lid for closing said top, said tank having a bottom wall which constitutes said supply conduit and which includes bosses separated by a throat receiving said one portion of said distributor device, said another portion including spaced apart ends disposed each in a section of said inverted channel in symmetrical relation to one another, said one portion of said distributor device being disposed vertically below said tank, said tank including a pan having a bottom engaging said bosses, said bottom having a centrally located orifice for discharge of the contents of said pan, said tank having flushing means movable between an actuated position where said orifice is opened to permit discharge therethrough and a deactuated position where said orifice is closed to block discharge therethrough, said orifice being disposed vertically above said one portion of said distributor device.

4,982,455

AUTOMATICALLY CONCEALED URINAL

Marjorie H. Carter, P.O. Box 170625, San Francisco, Calif. 94117

Filed May 12, 1988, Ser. No. 193,095
Int. Cl.[5] E03D 13/00
U.S. Cl. 4—307 **2 Claims**



1. An automatic urinal stored in a cabinet including in combination:

a cabinet with at least one door which opens and closes through use of an electronic operator means;

a urinal bowl mounted on a tubular support structure and communicating with a sewer via said support structure;

said urinal bowl, when stored, being located in a vertical position inside said cabinet, said urinal bowl movable to a position outside said cabinet with said door open, said use position causing said urinal bowl and said tubular support structure to be tilted outwardly from said cabinet to an angular position of substantially 15° with respect to a vertical plane;

said support structure including a tubular support section extending from the base of said urinal bowl being telescopically mounted in an upper tubular support section;

said upper support section being coupled to a pivoting joint for connecting said urinal bowl to said sewer;

said telescopic mount operating to raise and lower said urinal bowl for males of different heights;

fluid actuated moving means activated by said electronic operator means and coupled with said upper tubular support section for moving said urinal bowl from said vertical position to said tilted position in response to operation of said electronic operator means;

means for activating said electronic operator means to operate said moving means to move said urinal bowl from vertical to tilted position when a person moves into a predetermined position in front of said urinal, said moving means returning said tilted urinal to vertical position within said cabinet when said person moves away from said predetermined position; and

means for supplying flushing fluid into said urinal bowl simultaneously with opening of said door and movement of said angularly tilted urinal bowl to said use position.

4,982,456

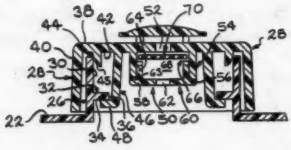
PORTABLE TOILET WITH VENT FOR FLUSH WATER SUPPLY TANK

David B. Cameron, Milford, Mich., assignor to Thetford Corporation, Ann Arbor, Mich.

Division of Ser. No. 118,561, Nov. 9, 1987, Pat. No. 4,850,064. This application Feb. 27, 1989, Ser. No. 315,539

Int. Cl.[5] B65D *51/16*

U.S. Cl. 4—321 **3 Claims**



1. A closure removably mountable to a fill tube for a storage tank for toilet flush water, said closure and said fill tube including coacting means operable to prevent unwanted removal of the closure, said closure including a top lid having an aperture to allow air to flow into the tank via the tube, and seal means disposed below said aperture and operable to close the aperture, said seal means including a sealing member for closing said aperture and means movable mounting said sealing member on said lid in communication with the interior of said storage tank so that water splashing in said tank can move said sealing member into a position closing said aperture, said means mounting said sealing member comprising a cage extending downwardly from the inner surface of the top lid and defining an interior chamber for captivating said sealing member, said sealing member being adapted to move into engagement with said lid to a position closing said aperture when said tank is inverted;

said closure further comprising a vertically slotted shoulder extending around said chamber to define a plurality of angularly spaced posts, and said sealing member comprises a flat disk the outer periphery thereof being sized to seat on the posts without blocking the slots between the posts but movable to close the aperture in the top lid;

said cage including a cylindrical boss extending downwardly from the lid, and a support member for said sealing member, said support member having a cylindrical sidewall and being removably mounted in said boss, the sidewall terminating in an annular end face to define said shoulder.

4,982,457

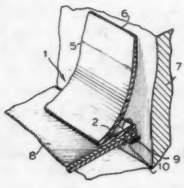
DEVICE FOR PREVENTING FALLING OF PERSONS BETWEEN POOL COVER AND POOL WALL

William Donston, 1585 Sycamore Ave., Bohemia, N.Y. 11716

Continuation of Ser. No. 29,231, Aug. 8, 1988, abandoned. This application Feb. 12, 1990, Ser. No. 479,443

Int. Cl.[5] E04H *4/10*

U.S. Cl. 4—504 **3 Claims**



1. A device for preventing the falling of a person between a pool cover and the surface of a pool wall wherein spatial gaps exist between said cover and said wall, and the like, comprising:

a pool cover;

a protective element formed to extend over a contour of said pool cover and a pool wall, said protective element having a cross section which includes a first substantially horizontal portion arranged to be placed onto said pool cover and having an outer edge arranged to face toward the pool interior and an inner edge arranged to face toward said pool wall;

sealing means comprising a second flexible inclined portion which extends from said outer edge of said first portion toward said pool wall at an angle relative to said first portion, said second flexible inclined portion being removably adjacent to said pool wall for cooperating with and conforming to the curved, irregular surface of said pool wall,

said second portion being bendable in a three dimensional spatial relationship against the curved, irregular surface of said pool wall;

said second portion being further capable of overlapping said spatial gaps between said pool cover and said pool wall;

said second portion being inclined in its inflexed state relative to said first portion at an acute angle of substantially between 30 degrees and 60 degrees.

4,982,458

DRIP TRAY

Wolfgang Arnet, 5/33 Elaine Avenue, Avalon Beach, New South Wales, 2107, Australia

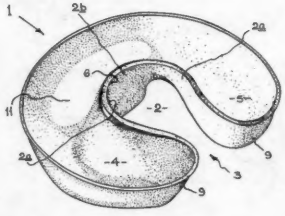
Continuation of Ser. No. 227,734, Aug. 3, 1988, Pat. No. 4,933,998. This application Jan. 29, 1990, Ser. No. 471,435

Claims priority, application Australia, Feb. 29, 1988, 12369/88

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] A45D *44/08*

U.S. Cl. 4—521 **3 Claims**



1. A drip tray for use in hairdressing for mounting around the neck of a wearer for collecting excess liquid applied to the head of the wearer and being made of flexible material and comprising:

a U-shaped configuration defining a trough which is symmetrical with respect to a centerline and has a bridging portion and opposite leg portions,

a neck receiving opening defined by:

a curved inner edge of said bridging portion with a center of curvature on the centerline and which subtends a reflex angle with respect to the center of curvature, and

end extensions of said curved inner edge comprised of a first inner edge part on each of said leg portions which first inner edge parts converge with respect to the centerline of the tray,

a neck engaging lip extending along the length of the curved inner edge of the bridging portion and along the length of said first inner edge parts of said leg portions so as to provide for an embracing engagement of said engaging lip

of said neck opening with a substantial portion of the circumference of the neck of the wearer of said drip tray,

a neck access slot extending radially from said neck opening defined by:

oppositely positioned convexly curved second inner edge parts of the respective leg portions with a distance between proximal surfaces of said two convexly curved second inner edge parts less than the diameter of said neck opening,

said trough having a U-shaped liquid receiving cross-section extending between said neck engaging lip and an outer edge of the trough; and,

said trough further defining a trough floor with depressed sections in said bridging portion and adjacent the terminal ends of said leg portions forming depressed reservoirs;

said depressed reservoirs being located so as to define tray supports adapted to engage the respective shoulder portions of a user with the head in an upright position.

4,982,459

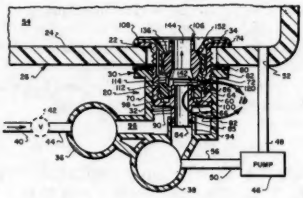
ADJUSTABLE AIR AND WATER ENTRAINMENT HYDROTHERAPY JET ASSEMBLY

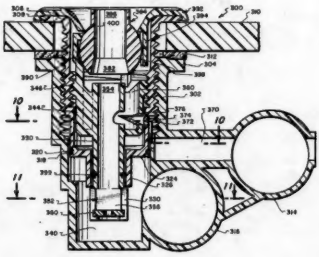
Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Continuation-in-part of Ser. No. 64,138, Jun. 19, 1987, Pat. No. 4,731,887. This application Mar. 21, 1988, Ser. No. 170,718

Int. Cl.[5] A61H *33/02*; E03C *1/02*

U.S. Cl. 4—541 **36 Claims**





1. A hydrotherapy jet assembly suitable for mounting in an opening of a water tube peripheral wall for discharging a water stream into said tub for impacting against a user's body, said assembly including:

housing means defining a mixing chamber and including means for discharging a water jet along a defined water jet axis into said chamber for creating a suction therein;

tubular flow direction means having an inlet orifice and discharge orifice;

means mounting said flow director means with said inlet orifice open to said mixing chamber and substantially aligned with said water jet axis whereby water supplied by said jet will flow through said flow director means to said discharge orifice;

first passageway means for passing water from said tub into said chamber, drawn by said suction, for entrainment by said water jet, said first passageway means including first valve means for selectively varying the flow therethrough;

second passageway means for passing air into said chamber, drawn by said suction, for entrainment by said water jet, said second passageway means including second valve means for selectively varying the flow therethrough;

a manual control means; and

means coupling said control means to said first and second valve means for selectively varying flow through said first and second passageway means.

4,982,460

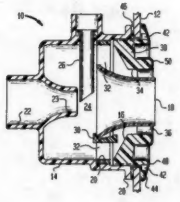
FLOW ENHANCING JET FITTING

Samuel Tobias, Edison; William E. Treene, Upper Montclair, and George E. Williams, Boonton, all of N.J., assignors to Hayward Industries, Inc., Elizabeth, N.J.

Continuation-in-part of Ser. No. 222,209, Jul. 21, 1988, abandoned. This application Mar. 28, 1989, Ser. No. 329,653

Int. Cl.[5] A61H *33/00*

U.S. Cl. 4—542 **14 Claims**



1. A jet fitting adapted to be mounted on a wall of a hydrotherapeutic receptacle, comprising a housing having a front, a rear, a top and a bottom, said top of said housing including a socket located outside the hydrotherapeutic receptacle and an aperture located in said socket and extending through said top of said housing; a mixing chamber located within said housing; first inlet means located adjacent said front of said housing for providing communication between said mixing chamber and the hydrotherapeutic receptacle; second inlet means located adjacent said rear of said housing for providing communication between said mixing chamber and a source of pressurized water, said second inlet means including accelerating means for increasing the velocity of water being discharged into said mixing chamber from said second inlet means to thereby create a low pressure condition within said mixing chamber which is sufficient to suck water into said mixing chamber through said first inlet means, whereby said mixing chamber also functions as a suction chamber; discharging means for discharging water supplied by said first and second inlet means to said hydrotherapeutic receptacle from said mixing chamber; and supplying means for supplying air to said mixing chamber in response to the low pressure condition created within said mixing chamber, said supplying means including a tube removably mounted in said top of said housing, said tube depending from said top of said housing and extending generally transversely into a water stream being discharged into said mixing chamber from said second inlet means, and said tube having an inlet end releasably received in said socket in said top of said housing and an elongated body sized and shaped so as to slidably extend through said aperture in said top of said housing whereby said tube can be inserted into or withdrawn from said mixing chamber through said top of said housing from outside the hydrotherapeutic receptacle, said body extending from said inlet end to an outlet end located opposite said inlet end and

positioned between said accelerating means and said discharging means in the flow path of said water stream, said outlet end having an opening in a bevelled surface located on a side of said outlet end which faces said discharging means and a solid wall portion on an opposite side which faces said second inlet means so as to cause said water stream to flow around said outlet end of said tube in such a manner that the low pressure condition created in said mixing chamber is augmented to thereby enhance the amount of air supplied to said mixing chamber from said opening in said outlet end of said tube, whereby a mixture of water and air is discharged into the hydrotherapeutic receptacle from said mixing chamber.

4,982,461

BATHTUB HAVING A PUMP, AND BATH SYSTEM HAVING A PUMP

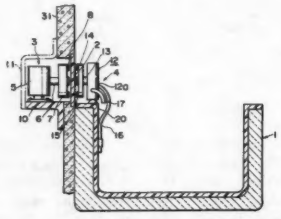
Toshio Mikiya, and Haruki Nakao, both of Tokyo, Japan, assignors to Nikko Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 304,591, Feb. 1, 1989, abandoned. This application May 21, 1990, Ser. No. 526,528

Claims priority, application Japan, Feb. 8, 1988, 63-15508; Feb. 8, 1988, 63-15509

Int. Cl.[5] A61H *33/02*

U.S. Cl. 4—544 **5 Claims**



1. A bathing system having a pump for generating a high-pressure jet-stream of water, comprising:

at least one wall having an inner surface, an outer surface, and including a flat thin portion made of magnetically permeable material, an inner surface of said thin portion located co-planar with said inner surface of said wall;

a bath tub arranged so that an upper periphery of the bath tub is located adjacent to said thin portion of said wall;

a pump arranged adjacent to the upper periphery of said bath tub at a position adjacent said inner surface of said thin portion, so as not to be placed under water in said tub, but to take in water from said tub and to pressurize said water;

a motor secured adjacent to an outer surface of said thin portion and opposing said pump; and

a magnetic coupling means having a driven drum coupled to said pump and having a surface opposing one side of said thin portion, a drive drum coupled to said motor coaxially with said driven drum and having a surface opposing the other side of said thin portion, a first plurality of magnets fixed to said surface of said drive drum, and a second plurality of magnets fixed to said surface of said driven drum and facing said first plurality of magnets;

said magnetic coupling means being disposed to magnetically couple said pump with said motor through said thin portion without direct contact between said motor and said pump.

4,982,462

MEDICAL ATTENDANCE BATHTUB BED

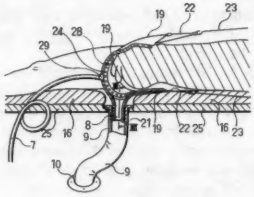
Mikuni Wada, 3-911, Hirabari, Tenpaku-ku, Nagoya-shi, Aichi-ken, Japan

Filed Mar. 27, 1990, Ser. No. 499,750

Claims priority, application Japan, Mar. 28, 1989, 1-35036[U]

Int. Cl.[5] A61H *33/02*; A47K *3/12*

U.S. Cl. 4—546 **2 Claims**



1. A medical attendance bathtub bed for use with a detachable mattress comprising:

(a) a bathtub having a hot water drain hole in the bottom thereof and a drain tube connected thereto;

(b) bathtub supporting means;

(c) a detachable stool body in said bathtub and including means for sealingly covering a person's public and anus regions;

(d) injector means provided inside said stool body for injecting a mixture of cleaning liquid and hot water to person's public and anus regions;

(e) said stool body having a cleaning liquid and hot water drain section, said drain section having an outlet conduit connected to said drain hole formed in said bathtub bottom; and

(f) means for supplying cleaning liquid and hot water to said injector means.

4,982,463

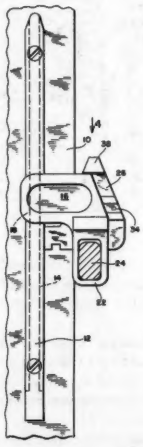
VERTICALLY ADJUSTABLE HOLDERS FOR THE SUPPORT FOR THE MATTRESS OF A CHILD'S CRIB

Benjamin K. Burnham, Merrimack, N.H., assignor to Gem Industries Inc., Gardner, Mass.

Filed Jun. 13, 1990, Ser. No. 537,257

Int. Cl.[5] A47D *7/03*

U.S. Cl. 5—11 **9 Claims**



1. A child's crib comprising two end panels and two connecting sides, and means to hold adjustably a mattress support in the crib, said means comprising a set of four brackets, the

brackets being mounted on the edge portions of the panels adjacent the sides,

a vertical guide for each bracket, said brackets being individually mounted on its guide to be vertically adjustable thereon, and means on each bracket and corresponding guide to lock the brackets in adjusted position,

means to manually release each bracket with respect to the locking means on the guides to provide for sliding the brackets up and down on the guides,

the locking means on the guides comprising vertical slots in the guides, each slot including a portion that provides entry thereto by the locking means on the bracket, said entry portions being shorter than the slots and positioned at the upper portion of each slot, and each locking means on the brackets comprising a hook that can enter the entries of the slots and then move down into the respective slot, whereby adjustment of the mattress support requires lifting the brackets slightly and retracting the hooks out of the entries,

elastomeric means biasing the hooks relative to the brackets to enter the slots, said locking means being slidable relative to the brackets against the action of said elastomeric means, and

means on each bracket receiving a portion of the mattress support.

4,982,464

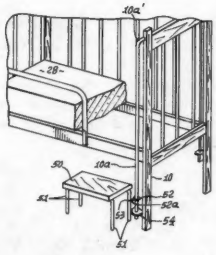
APPARATUS TO CONVERT A CRIB TO A BED, AND HAVING A STEP

Jay M. Lucero, 2453 Ridgewood #4, West Covina, Calif. 91792

Continuation-in-part of Ser. No. 71,869, Jul. 9, 1987, Pat. No. 4,763,368. This application Jul. 26, 1988, Ser. No. 224,392

Int. Cl.[5] A47D *7/01*

U.S. Cl. 5—93.2 **10 Claims**



7. In a crib, the combination comprising:

(a) a frame, and two end walls and one side wall connected to the frame, and two vertical supports respectively proximate or at corners defined by the frame,

(b) the mattress having an upper surface,

(c) a protective side rail extending generally parallel to and above one side edge of the mattress opposite said side wall, the rail having a vertical section and associated guide openings closely vertically receiving one of the vertical supports, for operatively holding the rail sidewardly to said one vertical support,

(d) and step structure connected to the other vertical support, and located below the level of said mattress upper surface.

4,982,465

LEVEL-VARIABLE SUPPORTING APPARATUS

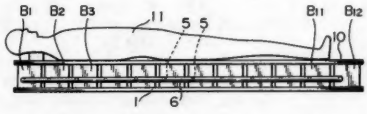
Nobuo Nagata, Yokohama, and Yoshitsugu Hirokawa, Kamakura, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 495,802

Claims priority, application Japan, Mar. 20, 1989, 1-69099; Mar. 27, 1989, 1-74182

Int. Cl.[5] A61G *7/04*; A47C *27/10*

U.S. Cl. 5—450 **21 Claims**



1. A level-variable supporting apparatus comprising:

at least one liquidtight container which is expandable and shrinkable in a prescribed direction;

a reversible swelling and contractive substance contained within said at least one container, said substance having a property such that it absorbs a swelling solution in a first range of temperatures so as to cause said substance to swell and discharges said swelling solution in a second range of temperatures so as to cause said substance to contract;

a liquid guide means connecting said at least one container to a source of swelling solution such that said solution may be supplied into and discharged from said container; and

a controllable heating means in heating relationship with said substance in said at least one container so as to control the temperature of said substance to vary between said first range and said second range to thereby control absorption and discharge of said swelling solution and cause said substance to controllably swell and contract, causing said at least one container to expand and shrink in said prescribed direction so as to change a supporting position of an object thereon.

4,982,466

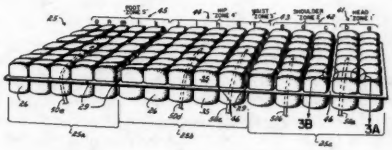
BODY SUPPORT SYSTEM

Larry Higgins; Terence A. Scott, both of Carthage, Mo., and Nozomu Kawasaki, Osaka, Japan, assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 12, 1988, Ser. No. 256,902

Int. Cl.[5] A47C *27/08*

U.S. Cl. 5—453 **35 Claims**



1. An inflatable mattress comprising

a pair of thin, flexible, plastic sheets each having a plurality of transversely and longitudinally extending pockets formed thereon,

said pockets being in alignment and sealed on a plane substantially entirely around their perimeters to form rows and columns of cells,

said cells being shaped when viewed in plan view as regular polygons,

the seals between adjacent cells being interrupted at the corners of adjacent cells to form fluid flow passage between the corners of adjacent cells, and

said fluid flow passages being defined in part by substantially vertical walls formed in said thin, plastic sheets so that the walls of said passages are upstanding from said central plane.

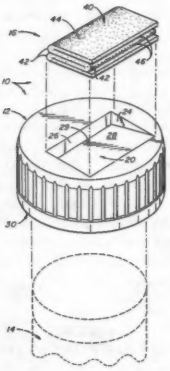
4,982,467

RINSE RELEASE LAUNDRY ADDITIVE AND DISPENSER

Eugene A. Mizusawa, Castro Valley; Donald J. Paone, Hayward; Tracey L. Casella, Martinez; Dorothy L. Flores, Livermore; Clement K. Choy, Walnut Creek; Jan Gerritsen, Walnut Creek;

The Clorox Company, Oakland, Calif.

Division of Ser. No. 193,310, May 11, 1988, Pat. No. 4,882,917.
This application May 11, 1989, Ser. No. 436,572
Int. Cl.[5] D06F *39/02*
U.S. Cl. 8—158 **3 Claims**



1. A method for introducing a rinse additive to a rinse phase of a fabric washing machine without interrupting a wash cycle thereof, the method comprising

(a) releasably placing about an upper portion of an agitator of a washing machine, prior to initiating a wash cycle, a wash additive packet, such that a center of mass of the packet is offset from a center of rotation of said agitator, the packet comprising a flexible substrate material, having a first stable conformation of a first outer surface area, and a second stable conformation of a second outer surface area, said second outer surface area being greater than said first outer surface area, the substrate having deposited thereon a dispersible wash additive for dispersion in an aqueous rinse solution;

(b) placing the substrate into said first stable conformation and placing said wash additive packet about said upper portion of said agitator prior to initiating said machine wash cycle;

(c) releasing the additive packet from said upper portion of said agitator into a surrounding wash tub, under centrifugal forces generated by a spin phase of said wash cycle; and

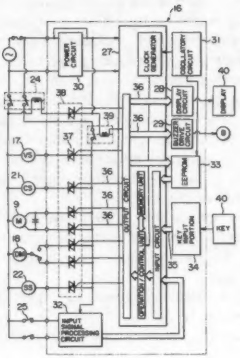
(d) adding said aqueous rinse solution to said wash tub whereby, the packet will attain said second stable conformation in, and release said additive into, said rinse solution.

4,982,468

METHOD FOR OPERATING WASHING MACHINE

Toshihiro Takahashi; Koichi Ito, and Hideyuki Tobita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1990, Ser. No. 473,431
Claims priority, application Japan, Feb. 13, 1989, 1-033358
Int. Cl.[5] D06F *33/02*
U.S. Cl. 8—159 **22 Claims**



1. A method for operating a washing machine which can selectively conduct a washing work in which a single operation or two or more operations selected from among a washing, a rinsing, and a dry spinning operation is carried out solely or in combination by means of supplying outputs to a load of said washing machine in accordance with commands inputted thereinto. said method comprising the following steps of:

reading out an accumulated value stored in a nonvolatile memory, representative of the number of washing works done in said washing machine;

comparing said read-out accumulated value with a value predetermined in advance, which is representative of a tolerance limit number of washing work of said washing machine;

making said washing machine inoperative when said read-out accumulated value is beyond said predetermined value; and

updating said accumulated value and storing the updated value into said nonvolatile memory as a new accumulated value each time such washing work is carried out in said washing machine.

4,982,469

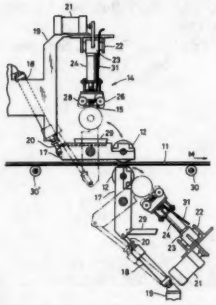
APPARATUS FOR CLEANING SURFACE OF SHEET

Hiroshi Nishiwaki, Izumi, Japan, assignor to Techno Roll Co., Ltd. and Kawasaki Steel Corp, Japan

Filed Jan. 2, 1990, Ser. No. 459,936
Claims priority, application Japan, Jan. 17, 1989, 1-9483
Int. Cl.[5] B06B *11/02*
U.S. Cl. 15—3 **5 Claims**

1. A sheet surface cleaning apparatus comprising: a rotatable dust removing roll having a sticky surface, means causing said roll to make rolling contact with the sheet surface to be cleaned; and a roll cleaning device mounted for movement substantially parallel with the axis of rotation of said dust removing roll and capable of cleaning the surface of said dust removing roll; wherein said dust removing roll is mounted for swinging movement between a position where it engages said roll cleaning device and a position where it engages said sheet surface, and wherein the surface of said roll cleaning device

contactable with said dust removing roll is formed of a flexible porous cleaning pad which is mounted so as to be delivered in



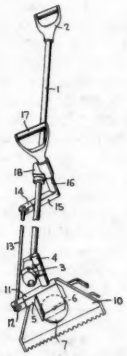
a direction substantially perpendicular to the axis of rotation of said dust removing roll.

4,982,470

APPARATUS FOR APPLYING OF AN ADHESIVE FOR FLOOR COVERINGS

Stephan L. Szabo, Küsnacht, Switzerland, assignor to S. Szabo AG, Zurich, Switzerland

Filed Sep. 26, 1989, Ser. No. 412,488
Int. Cl.[5] B05D *1/42;* E01C *19/12*
U.S. Cl. 15—104 S **6 Claims**



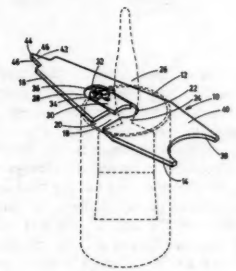
1. An apparatus for applying of an adhesive for floor coverings and including an applying spatula having a toothed edge, comprising a double joint and a stick which is suitable to be manipulated by a person in a standing posItIon and Is to be held obliquely relative to a respective floor and which applying spatula is mounted to the lower end of said stick such to be pivotable simultaneously around two axes, which double joint includes a bearing body mounted to the end of the stick and a first pivot axis supported therein and extending at an angle relative to said stick, and includes a joint body mounted to the first pivot axis and a second pivot axis supported in said joint body and a supporting body mounted to said second pivot axis at which supporting body said applying spatula is mounted to, comprising further an operating rod pivotably mounted to one end of said joint body at one of its ends at a distance from said first pivot axis, which operating rod extends parallel to said stick and is pivotably mounted at its other end to a lever extending at least approximately parallel to said joint body which lever is rigidly mounted to an operating axis extending at least approximately parallel to said first pivot axis and includes a handle, which operating axis is supported in a supporting body located approximately halfway along the longitudinal extent of the stick such to have the applying spatula pivoting around said first pivot axis by means of the manually rotatable operating axis at each point of return of said stick moved manually back and forth over a floor, whereby said applying spatula attains the respective position of its toothed edge parallel to the floor by a pressing thereagainst by a pivoting around said second pivot axis.

4,982,471

MULTI-USE PAINT TOOL

John A. Bannan, 10 Don Mills Rd., Suite 423, Don Mills, Ontario M3B 3N9, Canada

Filed Mar. 26, 1990, Ser. No. 498,665
Int. Cl.[5] B44D *3/06*
U.S. Cl. 15—105 **4 Claims**



1. An accessory for use with tools for applying liquid coatings comprising a rigid elongate member adapted as a manually movable cross-bar over an open topped vessel, the member comprising;

a slat having substantially flat top and bottom surfaces including;

a mid portion including holding means adapted to hold a brush to depend vertically from the elongate member to dip into the paint brush vessel when the member rests as a cross-bar over the mouth of the vessel, the holding means comprising a slot through the slat having one end opening to one side of the slat and a blind end located between the sides of the slat, the open end of the slot being of a width to allow access of a handle of a brush laterally thereinto;

one end portion having an arcuate portion adapted to scrape a portion of a cylindrical liquid coating applying roller; and

the other end portion having a prong adapted to fit into and slide in a groove in the rim of a paint can.

4,982,472

DEVICE FOR CLEANING THE VINYL FILM LINER OF SWIMMING POOLS

Terry D. Lustofin, 17 Pine Hill Bend, Ballston Lake, N.Y. 12019

Filed Aug. 18, 1989, Ser. No. 395,543
Int. Cl.[5] A47L *13/46*
U.S. Cl. 15—244.1 **3 Claims**

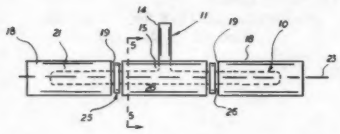
1. A cleaning device adapted to be removably positioned at an extremity of an elongated manipulating handle for scrubbing a vinyl film liner of a swimming pool, said cleaning device comprising:

(a) a straight rigid transverse member having a circular cylindrical configuration elongated between two opposed extremities.

(b) a post member which perpendicularly joins said transverse member at a site midway between said extremities,

thereby defining half lengths of said transverse member extending between said site of joinder and respective extremity,

(c) two identical resilient sponges each disposed upon a half length and held thereupon by waterproof adhesive, each sponge having a circular cylindrical outer configuration terminating in two end faces perpendicularly disposed to the center axis of said cylindrical outer configuration, and an internal bore of circular cylindrical configuration disposed upon said axis and opening upon one of said end faces, the openings of said two sponges being in facing relationship, the length of said bore being sufficient to accommodate the respective half length, and the diameter



of said bore being approximately the same as the diameter of the respective half length, thereby providing adequate surface contact to ensure secure adhesive joining of the sponge upon the half length, and

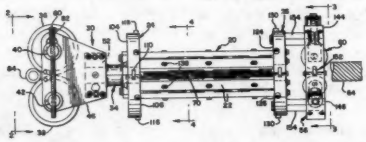
(d) a collar positioned upon each half length at a position between a respective sponge and the post member, said collars being identical and having two opposed substantially flat surfaces perpendicularly oriented to the cylindrical surface of the half length and having a circular perimeter disposed in coaxial relationship with said half length, the diameter of said circular perimeter being slightly smaller than the cylindrical diameter of the sponge.

4,982,473

WIRE ROPE CLEANING APPARATUS

Charles J. Farris; Joseph E. Whitlow, and Paul E. Sitzes, all of Sedalia, Mo., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed May 23, 1988, Ser. No. 197,519
Int. Cl.[5] B66B 7/12
U.S. Cl. 15—256.6 **15 Claims**



1. An improved apparatus for treating the surface of wire rope comprised of plural twisted strands while the wire rope is operational, said apparatus comprising:

cage means having two spaced ends each with central openings to receive a wire rope and permit the wire rope to move through said cage means;

follower rollers connected to said cage means and extending inwardly thereof into contact with the valleys between strands of said wire rope;

a plurality of tools ranged within said cage means and extending inwardly thereof into functional engagement with the outer surface of said wire rope;

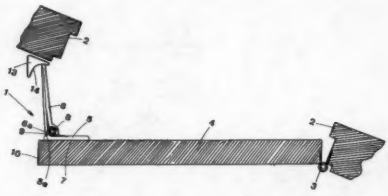
and yoke means rotatably connected to said cage means whereby to anchor said apparatus at a fixed location along the path of said wire rope and while permitting said cage means to spin around said wire rope as said follower rollers track said strands.

4,982,474

DOOR BLOCKING DEVICE

Åke Kjellström, S-616 00, Åby, Sweden

PCT No. PCT/SE88/00306, § 371 Date Nov. 28, 1989, § 102(e) Date Nov. 28, 1989, PCT Pub. No. WO88/09861, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 7, 1988, Ser. No. 435,455
Int. Cl.[5] E05F 5/02
U.S. Cl. 16—82 **2 Claims**



1. Arrangement for a door intended, in conjunction with the closing of same, to prevent injury by crushing between the door leaf and the case, comprising a body component with a plane surface intended to be mounted against the door leaf, in which body component a longitudinal blocking component is pivotally mounted, characterized in that the aforementioned body and blocking components have means which define a relative angular position essentially involving the direction of longitudinal extension of the blocking component forming a normal to the plane surface of the body component, which angular position the components are forced to adopt by a spring, acting between said body and blocking components in conjunction with which the body component with the blocking component mounted in it is intended to be mounted on the inside of the door leaf in a position such that, as the door is opened from a closed position, the blocking component, sliding against the inside of the door case along its length, finally leaves the case and freely adopts the aforementioned relative angular position in which, when the door is closed again, the free end of the blocking component will come up against the front of the case and will thus prevent the door from being fully closed and that the arrangement comprises a buffer element intended to be applied to the front of the door case at the point at which the free end of the blocking component is expected to come up against the front of the case, which buffer element exhibits a concave, curved contact surface for the aforementioned free end of the blocking component.

4,982,475

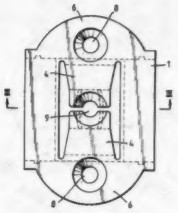
ARRANGEMENT IN A DOOR HINGE WITH TWO HINGE FLAPS AND AN ATTACHING PLATE FOR ONE OF SAID HINGE FLAPS

Tore Killingstad, Linjeveien 3, N-1084 Oslo 10, Norway

Division of Ser. No. 154,153, Feb. 9, 1988, abandoned. This application Aug. 11, 1989, Ser. No. 393,853
Claims priority, application Norway, Feb. 23, 1987, 870723
Int. Cl.[5] E05D 7/12
U.S. Cl. 16—257 **3 Claims**

1. An arrangement in a door hinge comprising an attachment plate and two hinge flaps, one of said hinge flaps having the shape of a tongue fitting slidably into a pocket in said attachment plate from either accessible sides when said attachment plate is positioned in milled recesses in the edge of a door, and with said tongue shaped hinge flap having an aperture and being retained in position in said attachment plate by locking means, said locking means characterized in that said attachment plate is provided with at least two opposed resilient pawls having lugs and ends, said opposed resilient pawls extending in a direction perpendicular to the direction of movement of said hinge flap having shape of a tongue, said lugs allowing locking said tongue shaped hinge flap in position by

spring lock action between said lugs and said aperture in said tongue shaped hinge flap, and said ends of said opposed resilient pawls having recesses being receptive of receiving a screw head.



4,982,476

MOUNTING PLATE FOR A FURNITURE HINGE OR THE LIKE

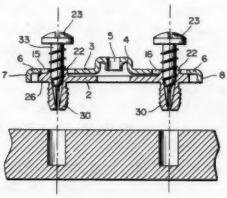
Luciano Salice, Carimate, Italy, assignor to Arturo Salice S.p.A., Novedrate, Italy

Filed Dec. 13, 1989, Ser. No. 448,126

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1988, 3841933

Int. Cl.[5] E05D *5/00*

U.S. Cl. 16—382 **8 Claims**



1. A mounting for a furniture hinge including a hinge bracket, said mounting plate comprising:

a baseplate provided with bores for receipt of fixing screws and adapted to be secured to a carrying wall,

a cover plate at least partly covering the baseplate and said cover plate being slidably guided on the baseplate transversely to the hinge bracket and including means for mounting the hinge bracket so that premounted fixing screws extend through slots in the cover plate and are partly screwed in said bores of the baseplate, and

fixing screws having a thread diameter greater than a width of the slots and the pitch of the screw threads of the fixing screws is at least twice the thickness of the cover plate at edges of the slots so that a side face of each screw thread bears on top of an edge of the slots to hold the baseplate in engagement with the cover plate.

4,982,477

METHOD AND APPARATUS FOR DETECTING SLIVER FEED

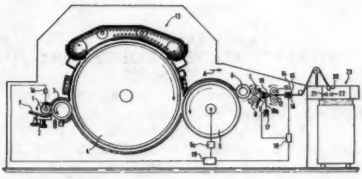
Fritz Hösel, Mönchen-gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-gladbach, Fed. Rep. of Germany

Filed Oct. 4, 1989, Ser. No. 416,780

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1988, 3834110

Int. Cl.[5] D01G *31/00*

U.S. Cl. 19—0.25 **13 Claims**



1. A method of detecting feed or standstill of a fiber sliver comprising the steps of sequentially performing thickness measurements of the sliver by a sensor situated along a feed path of the sliver and comparing the thickness measurements for determining thickness deviations in the sliver in the course of a time lapse, whereby the measurements are analyzed and a signal relating to a sensed standstill may be used to stop a sliver transport device.

4,982,478

CARDING MACHINE WITH MODULAR SUBDIVISION OF THE CARDING ZONES

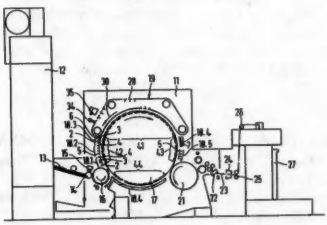
Urs Stahli, Turbenthal; Peter Fritzsche, Winterthur; Marcel Bosshard, Eschlikon, and Robert Demuth, Nuerensdorf, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Oct. 20, 1989, Ser. No. 424,505

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1988, 3835776

Int. Cl.[5] D01G *15/26*

U.S. Cl. 19—102 **23 Claims**



1. A carding machine comprising a licker-in, a main cylinder and a doffer, the carding machine including in a direction of rotation of the main cylinder a main carding zone which can include a flat arrangement, a pre-carding zone between the licker-in and the main carding zone, a recarding zone between the main carding zone and the doffer and an intermediate carding zone between the doffer and the licker-in, at least one of the pre-carding, main carding, recarding and intermediate carding zones being subdivided with respect to an axis of rotation of the main cylinder into a plurality of angular ranges, each of which has an angular extension equal to an integer of at least one times a unified angular extension, the carding

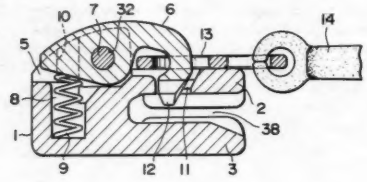
machine further including pre-adjusted modules carrying at least one pre-adjustable piece of equipment of the carding machine, the pre-adjusted modules being mountable in the subdivided zone of the carding machine, each pre-adjusted module including a pair of spaced-apart fastening plates, each of which is mountable on a respective side of the main cylinder and has an angular extension around the axis of the main cylinder corresponding to an integer of at least one times the unified angular extension, each pair of fastening plates including means for mounting thereon at least one pre-adjustable piece of equipment of a card having an angular extension around the axis of the main cylinder corresponding to an integer of at least one times the unified angular extension.

4,982,479

AUTOMATIC LOCKING SLIDER FOR SLIDE FASTENERS

Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,152
Claims priority, application Japan, Feb. 13, 1989, 1-33487
Int. Cl.[5] A44B *19/30*
U.S. Cl. 24—424 7 Claims



1. An automatic locking slider for slide fasteners comprising a slider body including a pair of upper and lower wings joined together, the upper wing having a pair of opposed lugs provided protuberantly on its upper surface adjacent its front end to thus define a groove therebetween; a locking member fitted in the groove and pivotted at its middle to the opposed lugs, the locking member having at its rear end a locking prong; a spring member provided on the slider body for normally urging the front end of the locking member upwardly so as to bring the locking prong into locking disposition; and a pull tab for pulling up the rear end of the locking member so as to bring the locking prong out of locking disposition for reciprocation of the slider; the lugs being so bulged roundedly as to have their respective outer sides to extend substantially to and merge into the edge of the front end and as to substantially enclose a front half of the locking member on its opposed sides.

4,982,480

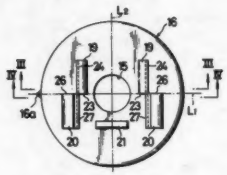
PAIR OF SNAPPINGLY ENGAGEABLE MEMBERS

Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan

Continuation of Ser. No. 197,144, May 23, 1988, abandoned.
This application Jan. 3, 1990, Ser. No. 462,351
Claims priority, application Japan, May 20, 1987, 63-73543; May 25, 1987, 62-78409[U]
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—575 9 Claims

1. A pair of snappingly engageable members of identical shape each comprising:

a base having a pair of male snap legs disposed on and projecting from one surface thereof in spaced confronting relation to each other, said male snap legs having bulging portions, respectively, projecting laterally away from each other, and a pair of female snap legs disposed on said one surface in spaced confronting relation to each other, said female snap legs projecting from said one surface in the same direction as said male snap legs and having a pair of locking portions, respectively, projecting laterally toward each other, said bulging portions and said locking



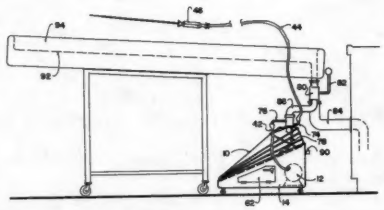
portions having longitudinal ends partially touching to and confronting each other.

4,982,481

EMBALMING DEVICE AND METHOD OF EMBALMING

George R. Deutscher, 12327 - St. Albert Trail, Edmonton, Alberta, Canada (T5L 4G9)

Filed Jun. 29, 1989, Ser. No. 372,841
Int. Cl.[5] A61G *17/00*
U.S. Cl. 27—21.1 16 Claims



1. A corpse preparation device comprising:

a disposable container having a first end and second end, and being shaped for insertion in a coffin, and having inlet means for insertion of fluids into the disposable container:

the disposable container tapering towards the second end and having sufficient rigidity to withstand the suction required to aspirate hollow body organs, the disposable container having outlet means for evacuation of air from the disposable container and including valve means connected to the outlet means for preventing backwash of fluids into the outlet means from the interior of the disposable container; and

means disposed within the disposable container to shield the outlet means from splashes caused by insertion of fluids into the container.

4,982,482

METHOD FOR THE MANUFACTURE OF LEAD-ACID BATTERIES AND AN ASSOCIATED APPARATUS AND ASSOCIATED LEAD-ACID BATTERY

Ellis G. Wheadon, Bernville, and Larry L. Forrer, Reading, both of Pa., assignors to Caltec International, Inc., Temple, Pa.

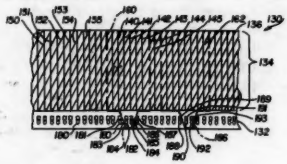
Filed Feb. 24, 1989, Ser. No. 315,722
Int. Cl.[5] H01M *4/82*
U.S. Cl. 29—2 20 Claims

1. A method of making battery grid strip for battery plates for use in lead-acid batteries comprising the steps of

providing a battery grid material, and

forming said battery grid material into a battery grid strip having a reticulated grid strip portion, a lug strip portion disposed on one side of said reticulated grid strip portion and a border strip portion disposed adjacent to said reticu-

lated grid strip portion on the opposite side of said reticulated grid strip portion from said lug strip portion, said lug



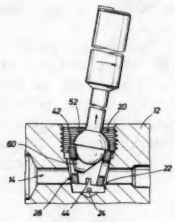
strip portion having at least one section that is an outwardly projecting protrusion.

4,982,483

VALVE SEAT TOOL FOR REMOVING AND INSERTING VALUE SEATS

Walter T. Roush, Houston, Tex., assignor to Keystone International Inc., Houston, Tex.

Filed Nov. 30, 1989, Ser. No. 443,321
Int. Cl.[5] B23P *19/02*
U.S. Cl. 29—213.1 **6 Claims**



1. For removal of a frusto-conical tubular valve seat from a seat cavity in an open valve chamber of a valve body with the seat having a pair of opposed ports in axial alignment with a straight flow passage extending through the valve body, the tubular seat having an open outer end and adapted to receive a tapered plug valve member in closed position for blocking fluid flow through said ports and flow passage; an improved seat removal tool comprising:

an elongate body having a handle on an outer end portion thereof for gripping manually by an operator and a seat actuator on an opposed inner end portion thereof;

said seat actuator including a generally laterally extending protuberance on its inner end, an integral hemispherically shaped bulbous portion adjacent the laterally extending protuberance being in axial alignment with the longitudinal axis of the elongate body, and an inwardly facing annular shoulder about the hemispherically shaped portions, said protuberance projecting laterally outwardly from said hemispherically shaped bulbous portion;

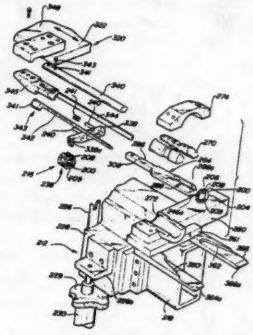
said hemispherically shaped portion adapted to be inserted within said open outer end of said frusto-conical tubular valve seat with said protuberance inserted within a port of said valve seat and said annular shoulder engaging the outer annular surface of the tubular valve seat whereby upon the manual exertion of a pivotal force against said handle in a plane aligned with the longitudinal axis of the flow passage the protuberance engages the seat surface defining the port and the shoulder forms a pivotal axis for the tool to pry the seat loose from its seat cavity within the valve chamber.

4,982,484

APPARATUS FOR ASSEMBLING INTERNAL RETAINER RING HAVING LUGS INTO A BORE

Deryll Liechty, Berne, Ind., assignor to Micro-Precision Operations Inc., Berne, Ind.

Division of Ser. No. 219,054, Jul. 14, 1988, Pat. No. 4,856,169, which is a continuation-in-part of Ser. No. 600,237, Apr. 16, 1984, abandoned, which is a division of Ser. No. 362,203, Mar. 26, 1982, Pat. No. 4,484,642
This application Apr. 14, 1989, Ser. No. 337,895
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—229 **18 Claims**



1. An apparatus for assembling an internal retainer ring having spaced apart lugs in a bore of an article comprising:

(a) a ring compressing assembly movable between a ring load position and an assembly position adjacent the article, said ring compressing assembly being configured to compress the retainer ring to a reduced assembly size as it is moved therethrough,

(b) first slide means having the ring compressing assembly thereon for positioning the ring compressing assembly at the ring load position to receive a retainer ring and then to position the ring compressing assembly at the assembly position adjacent the article,

(c) means for moving the retainer ring through the ring compressing assembly and into the bore of the article after the compressing assembly is positioned at the assembly position, said moving means including a ring pusher member for contacting the retaining ring and a second slide means on which the pusher means is disposed, said second slide means being operably coupled to the first slide means for movement in unison with the first slide means as the ring compressing assembly is moved between the ring load position and the assembly position and movable relative to the first slide means toward the first slide means after the ring compressing assembly is positioned at the assembly position to cause the pusher means to push the retainer ring through the ring compressing assembly to compress it to reduced assembly size and into the bore of the article.

4,982,485

METHOD OF MANUFACTURING MONOLITHIC CERAMIC CAPACITOR

Shunsuke Nakaya; Harunobu Sano, and Yoshiaki Kohno, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 13, 1989, Ser. No. 406,456
Claims priority, application Japan, Sep. 13, 1988, 63-230391
Int. Cl.[5] H01G *7/00*
U.S. Cl. 29—25.42 **9 Claims**

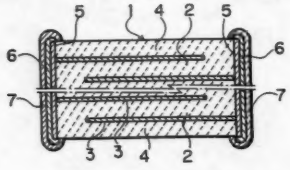
7. A method of manufacturing a monolithic ceramic capacitor, comprising the steps of:

preparing a ceramic laminate body having first and second

end surfaces which are opposite to each other, and having first and second inner electrodes arranged therein in parallel with each other, said first and second inner electrodes being exposed to receive an electrical connection at said first and second end surfaces respectively;

firing said ceramic laminate body;

forming a conductive ceramic paste;



applying said conductive ceramic paste on said first and second end surfaces of said ceramic laminate;

firing said ceramic laminate to form respective ceramic films on said first and second end surfaces of said ceramic laminate; and

forming respective outer electrodes on said conductive ceramic films.

4,982,486

METHOD FOR PRODUCTION OF MOLDING FOR VEHICLES

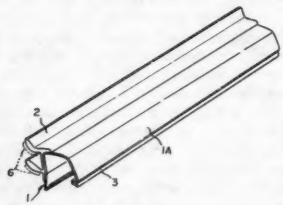
Atsushi Otagawa, Urawa, and Toshio Okabe, Ageo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Sankei Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 3, 1989, Ser. No. 416,305

Claims priority, application Japan, Oct. 7, 1988, 63-253594

Int. Cl.[5] B23P *25/00*

U.S. Cl. 29—527.4 **1 Claim**



1. A method for manufacturing a molding for vehicles, which comprises the steps of: forming a stainless steel web into a main body of a predetermined cross-section for said molding; then attaching on said main body, in a longitudinal direction of said main body with an adhesive and with a portion of said main body projecting therefrom, members of soft synthetic resin formed by extrusion-molding, said resin members extending beyond a longitudinal edge of said adhesive; and subjecting said main body and said members to chromium-plating such that a coating layer of chromium is adhered onto the exposed surface of said projecting portion of said stainless steel main body, which constitutes its outside when said molding is mounted on the vehicle body.

4,982,487

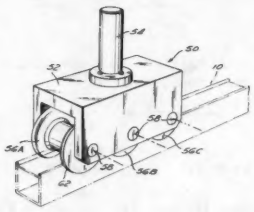
METALLIC COMPONENT COLD ROLL/CRIMPING TOOL

Shuji U. Maruko, Orange, and Richard R. Mulliner, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 27, 1988, Ser. No. 263,675

Int. Cl.[5] B23P *11/00*; **B21D** *39/18, 39/02*

U.S. Cl. 29—243.58 **16 Claims**



1. An apparatus for sealing a beaded top cover on a generally U-shaped metallic housing having spaced vertical sidewalls terminating in vertical flanges, the apparatus comprising:

a carrier adapted to be positioned adjacent one surface of the housing during relative lateral movement between said housing and said carrier; and

plural roller dies rotatably mounted to said carrier and laterally spaced from one another to progressively bend and crimp the flanges formed on said housing about a raised bead formed on said top cover, wherein each of said plural roller dies includes a pair of registration members each dispersed in abutting registry with said housing vertical side walls to provide structural support to said housing during sealing.

4,982,488

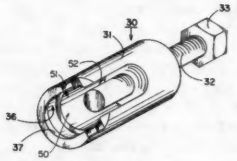
ATTACHING MEANS REMOVAL TOOL

Frank D. Ragsdale, Sr., Route 11, Box 387, Winston-Salem, N.C. 27107

Continuation of Ser. No. 146,176, Jan. 20, 1988, Pat. No. 4,886,391. This application Sep. 11, 1989, Ser. No. 405,129

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—263 **6 Claims**



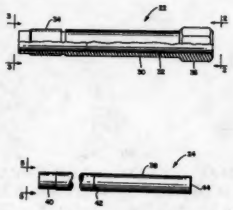
1. An attaching means removal tool for removing an attaching means positioned on a stud from within an aperture, said tool comprising: a smooth cylindrically-shaped housing, a threaded member, said threaded member displaceably mounted within said housing, said housing defining an interior circumferential groove and an exterior longitudinal slot, said slot having a relatively wide mouth and a narrow neck, said neck extending rearwardly of said circumferential groove along said housing approximately twice the length of said mouth whereby an attaching means positioned within said circumferential groove is removed from the aperture by displacing said threaded member into said attaching means to urge said attaching means therefrom.

4,982,489

TOOL SET AND METHOD FOR GAUGING AND RESTORING CONCENTRICITY BETWEEN AXIAL SECTIONS OF A WORKPIECE BORE

John M. Haugen, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 23, 1989, Ser. No. 425,544
Int. Cl.[5] B23B 49/02
U.S. Cl. 29—402.01 19 Claims



18. A method for gauging and restoring a relationship of concentricity between first and second axial sections of a bore formed in a workpiece, comprising the steps of:

(a) inserting a hollow gauge sleeve within the bore and into a concentric relationship with the first axial section thereof;

(b) inserting a gauge rod through the sleeve to attempt to extend an inner end of the rod from the sleeve through a predetermined distance within the second axial section of the bore such that (i) if the inner end of the rod can be extended through the predetermined distance within the second axial section of the bore, then a concentric relationship is found to exist between the second axial section of the bore and the sleeve and thus between the first and second axial sections of the bore, whereas (ii) if the inner end of the rod cannot be extended through the predetermined distance within the second axial section of the bore, then an eccentric relationship is found to exist between the first and second axial sections of the bore;

(c) withdrawing the rod from the sleeve and, if the concentric relationship was found to exist between the first and second axial sections of the bore, then discontinuing further operations; and

(d) withdrawing the rod from the sleeve and, if the eccentric relationship was found to exist between the first and second axial sections of the bore, then inserting a reamer through the sleeve and rotating the reamer to remove material from the workpiece at the second axial section of the bore until a relationship of concentricity is restored between the first and second axial sections of the bore.

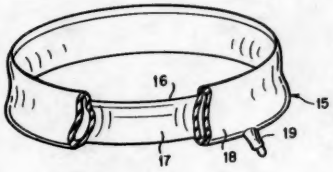
4,982,490

METHOD OF LINING A FLUID CONDUIT

Hunter M. Franklin, Aldershot, England, assignor to Stephen Tracey, Aldershot and Stanley Robert Moore, Grayshot, both of, England

Filed Jul. 9, 1987, Ser. No. 71,467
Claims priority, application United Kingdom, Jul. 11, 1986, 8616898; Jul. 11, 1986, 8616899
Int. Cl.[5] E03F 3/04; F16L 55/18
U.S. Cl. 29—407 9 Claims

1. A method of lining a main fluid conduit having a branch conduit comprising the steps of: positioning within the branch conduit by inserting therein from a position within the main fluid conduit a locating means having an expandable chamber; attaching to the locating means expansion control means communicating with the locating means from within the main fluid conduit; admitting fluid under pressure into the expandable chamber by use of the expansion control means, thereby expanding the chamber and retaining the locating means in the branch conduit; detaching the expansion control means from the locating means; providing a tubular liner within the main fluid conduit; inserting within the tubular liner detecting means for responding to the locating means; maneuvering the detecting means within the liner and locating a position of the locating means by use of the detecting means; cutting through the liner at the position where the locating means is detected, thereby forming a port in said liner which substantially coincides with the branch conduit; removing fluid from the expandable chamber, thereby contacting the chamber; and withdrawing the locating means from the branch conduit through the port and into the liner of the main conduit for removal therefrom.

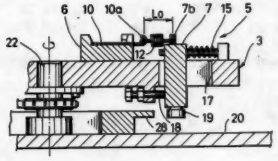


4,982,491

METHOD AND APPARATUS FOR FITTING COIL SPRINGS

Yasuhiro Yamashina, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1989, Ser. No. 421,936
Claims priority, application Japan, Oct. 17, 1988, 63-261113
Int. Cl.[5] B23P 11/00
U.S. Cl. 29—436 2 Claims



1. A method of interconnecting two components with a helical extension spring, comprising the steps of:

attaching a helical extension spring to a first component;

stretching said helical extension spring to a predetermined length;

moving said first component with said stretched helical extension spring maintained at said predetermined length, as one integral unit, relative to a second component to which said first component with said stretched helical extension spring is to be connected; and

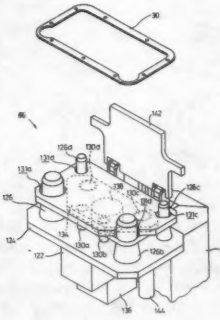
connecting said stretched helical extension spring to said second component, thereby to interconnect said first and second components.

4,982,492

METHOD OF INSTALLING GASKET INTO AUTOMOTIVE DOOR HANDLE

Hiroyuki Noguchi, and Cort Springer, both of Marysville, Ohio, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 333,915
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—446 6 Claims



1. A method of installing a gasket on a flange of a handle case of a door handle to be attached to an outer surface of an automotive door panel in an automatically assembling process of the door handle, wherein an installed gasket has a final shape conforming to the shape of the flange of the handle case, said method comprising the steps of:

separating one gasket at a time from a vertically suspended stack of gaskets, said separated gasket having a predetermined shape;

correcting said predetermined shape of the separated gasket by tensioning and pressing said separated gasket to said final shape, said final shape of the separated gasket conforming to said shape of the flange of the handle case; and thereafter

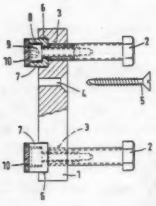
mounting said gasket on the flange of said handle case while tensioning the gasket.

4,982,493

EXTRACTION DEVICE FOR LOCK CYLINDERS

Adalbert Wendt, Sonnenhang 17 D-5010, Bergheim 3, Fed. Rep. of Germany

PCT No. PCT/EP88/00535, § 371 Date Feb. 28, 1989, § 102(e) Date Feb. 28, 1989, PCT Pub. No. WO89/00229, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 16, 1988, Ser. No. 327,985
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 8708961[U]
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—804 4 Claims



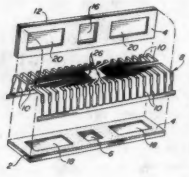
1. Extraction device for lock cylinders in door locks comprising a supporting bridge including a passage bore and a self-tapping screw in said passage bore, said self-tapping screw being adapted to be screwed into a lock cylinder to be extracted, the self-tapping screw serving as a tension rod; two through-going lift screws each arranged in an end region of the supporting bridge and parallel to the passage bore; and two supporting feet, wherein on its side to be facing the lock cylinder, the supporting bridge further includes two recesses within which are arranged said two supporting feet, respectively, said supporting feet rotatably supporting said lifting screws.

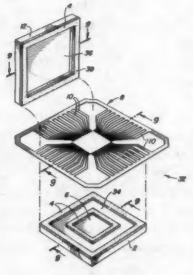
4,982,494

METHODS OF MAKING A LOW CAPACITANCE INTEGRATED CIRCUIT PACKAGE

Hiro Yonemasu; Kiyohide Shirai, both of San Diego, Calif., and Ikunosuke Kawamura, Vancouver, Wash., assignors to Kyocera America, Inc., San Diego, Calif.

Division of Ser. No. 307,830, Feb. 6, 1989, Pat. No. 4,931,854.
This application Jan. 31, 1990, Ser. No. 472,909
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—827 17 Claims





16. A method for manufacturing low-lead capacitance caps for use in packaging integrated circuit chips comprising the steps of:

(a) providing a cap substrate;

(b) depositing a sealing material on the cap substrate so as to form at least one discrete void in the sealing material, the at least one void being positioned such that when the cap substrate is placed on an associated base substrate having voids in a sealing material deposited thereon, the at least one void on the cap substrate and the voids in the base substrate form at least one sealing material-free cavity.

4,982,495

PROCESS FOR PRODUCING A CARRIER TAPE

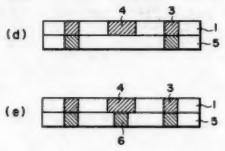
Masamitsu Okamoto, Yokohamashi; Masami Wada, Yokosuka; Hidenori Funikawa, Ichiharashi; Haruo Kato, Yokohamashi, and Hideaki Shouji, Ichihara, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Nov. 17, 1989, Ser. No. 437,635

Claims priority, application Japan, Dec. 15, 1988, 63-317136

Int. Cl.[5] H05K *3/02*

U.S. Cl. 29—846 1 Claim



1. A process for producing a carrier tape which comprises the steps of

(a) coating a polyimide varnish onto one surface of a continuous, electrically-conductive metal foil, followed by baking the thus coated foil;

(b) punching the resulting tape comprising a two layer structure consisting of said metal foil and polyimide film to form sprocket holes;

(c) cutting and removing a portion of said polyimide film by means of a cutting-processing machine to thereby form a device hole;

(d) coating a resist onto the other surface of said metal foil;

(e) subjecting the resulting resist to light-exposure by the medium of a mask for separating a circuit pattern and a circuit from said sprocket holes;

(f) subjecting the resulting resist to a developing treatment and etching said metal foil by the medium of a mask of said resist;

(g) removing said resist; and

(h) plating the resulting metal foil.

4,982,496

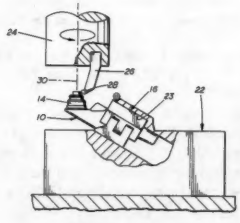
METHOD OF MAKING LUG JOURNAL FOR ROLLER CUTTER DRILL BITS

Paul I. Gaither, Houston, and Steve W. Klappenbach, Katy, both of Tex., assignors to Camco International Inc.

Filed Nov. 16, 1989, Ser. No. 437,180

Int. Cl.[5] B21D *53/10*; B23B *3/22*

U.S. Cl. 29—898.042 9 Claims



1. A method of finish machining a case hardened lug journal for a roller cutter drill bit comprising the following steps:

rough machining a journal on the extending end of a lug;

case hardening the rough machined journal on the lug;

placing the lug having the case hardened journal on the extending end thereof on a fixed stand with the journal having a central longitudinal axis;

mounting a holder for a cutting tool adjacent the journal for rotation of the holder about the central longitudinal axis of the journal;

removably mounting a first cutting tool on the holder for rotation with the holder about the journal;

rotating said first cutting tool about said journal to take a rough truing cut on the bearing surface of said journal and leaving between around 0.004 inch and 0.012 inch of stock material on the journal surface in excess of final dimensioning;

providing a sharp second cutting tool on the holder; and

rotating said second cutting tool about said journal in a final finish cut on said bearing surface of said journal for final dimensioning and providing a final finish having a roughness less than around 35 RMS.

4,982,497

PROCESS FOR MANUFACTURE OF A SUPERCONDUCTOR

Gerhard Mier, Singen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

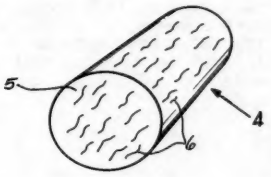
PCT No. PCT/CH88/00071, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/08208, PCT Pub. Date Oct. 20, 1988

PCT Filed Mar. 31, 1988, Ser. No. 295,249

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712320

Int. Cl.[5] H01L *39/24*

U.S. Cl. 29—599 8 Claims



1. A process for the manufacture of a superconductor having a conductor core with a longitudinal axis, and a sheath surrounding said core, said core being formed from an electrically conductive alloy and said sheath being formed from high-purity aluminum with ribbon-like low electrical conductivity materials extending substantially parallel to said longitudinal axis embedded therein, said sheath of high-purity aluminum having said low electrical conductivity materials embedded therein acting as a stabilizer, which process comprises:

providing an extrusion die having a molding cross-section; and

extruding said sheath about said core by passing said core through said die and by passing said high purity aluminum and said ribbon-like low conductivity materials through the molding cross-section of said die, thereby forming a stabilizer with markedly reduced electrical conductivity perpendicular to said longitudinal axis of the conductor core as a result of the low electrical conductivity materials embedded in the aluminum sheath, whereby eddy currents are suppressed to a large extent and undesired heating is restricted to a minimum.

4,982,498

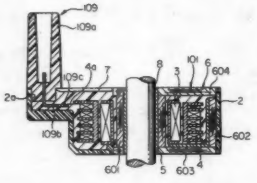
METHOD OF MAKING A HIGH-VOLTAGE TRANSFORMER

Tomokazu Umezaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 128,418, Dec. 3, 1987. This application Nov. 20, 1989, Ser. No. 439,192

Int. Cl.[5] H01F *7/06*

U.S. Cl. 29—602.1 **12 Claims**



4. A process for producing a high-voltage transformer comprising:

disposing a primary coil around an iron core in a coil case;

disposing around said primary coil a secondary coil having a lead wire;

separately forming a high voltage terminal assembly, said high voltage terminal assembly having a support member and a high-voltage terminal;

connecting said lead wire of said secondary coil to said high-voltage terminal while said support member is separate from said coil case;

attaching said support member to a portion of said coil case; and

securing said primary and secondary coils and said support member to said coil case by filling said coil case with a resin.

4,982,499

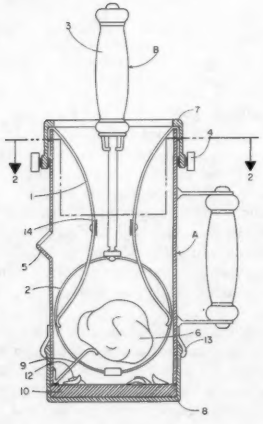
POTATO PEELER

Jacques Fortin, 7 Montaigne, Lévis, Quebec, Canada (G6V 8K4), assignor to Jacques Fortin, Levis, Canada

Filed Jan. 30, 1989, Ser. No. 303,297

Int. Cl.[5] A22B *5/16;* **A23N** *7/02;* **A49J** *17/00*

U.S. Cl. 30—123.5 **6 Claims**



1. A peeling apparatus comprising an elongated container, cutters carried within an intermediate section of the container and moveable transversely of the container, means biasing said cutters towards the longitudinal axis of said container, a basket for loosely surrounding an article to be peeled so that said article may rotate in all directions within the basket, means to reciprocate the basket within the container along the longitudinal axis of the container, said basket providing passages permitting insertion of said cutters within said basket during recriprocating movement of said basket.

4,982,500

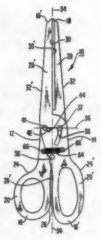
INSTRUMENT FOR CUTTING OR GRIPPING

Rajendrakumar N. Ramani, Highland Park, N.J., assignor to Five Star Idea, Inc., Highland Park, N.J.

Filed Nov. 20, 1989, Ser. No. 438,661

Int. Cl.[5] B26B *13/00*

U.S. Cl. 30—254 **30 Claims**



1. An instrument for cutting or gripping comprising:

two shanks, with each shank having a handle end and a working end, the two shanks being connected by at least two pivot means located between the handle end and the working end of each shank, each pivot means secured in one shank and passing through a corresponding channel in the other shank, each shank having a working member located between the working end and the pivot means, the working member having a working edge facing the other shank, there being a longitudinal axis in a direction from the handle ends toward the pivot means when the instrument is closed, the longitudinal axis being between the handle ends, and there is a lateral axis perpendicular to the longitudinal axis, a portion of each channel being substantially parallel to the lateral axis of the instrument to enable opposing working edges to be substantially parallel prior to being closed.

4,982,501

DEPTH OF CUT ADJUSTMENT FOR A PORTABLE CIRCULAR SAW

William D. Sauerwein, Phoenix; John W. Miller, Parkton; Stephen L. Vick, Reisterstown, and Rosemarie Bean, Finksburg, all of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Mar. 5, 1990, Ser. No. 488,823

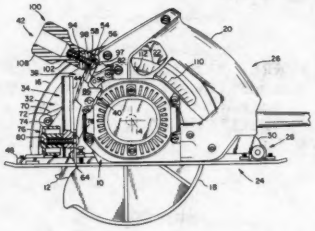
Int. Cl.[5] B27B *9/02*

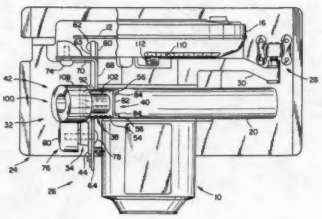
U.S. Cl. 30—376 **15 Claims**

14. A portable circular saw of the type in which a powered saw blade subassembly having first and second opposite ends is pivotably connected at its first end to a shoe and in which the second end is adjustably spaceable from the shoe by an adjustment means including cooperating slidably engaging arcuate members characterized in that:

the powered saw blade subassembly includes a fixed main operator's handle and in that the adjustment means includes a locking knob manipulable to lock the saw blade subassembly at a selected spacing from the shoe and the locking knob is carried in fixed relation to the shoe so that adjustment of the spacing between the saw blade subas-

sembly and the shoe may be effected by an operator holding the saw in one hand by the operator's handle and





grasping the locking knob with the other hand without relinquishing his grasp of the locking knob.

4,982,502

TELESCOPIC GUN SIGHT

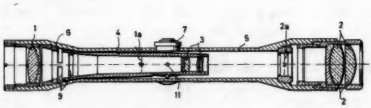
Adolf Weyrauch, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Continuation of Ser. No. 268,007, Nov. 7, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 489,478

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737856; Nov. 7, 1987, 8714828[U]

Int. Cl.[5] F41G *1/38*

U.S. Cl. 33—248 **14 Claims**



1. In a telescopic gun sight with a main tube which has sight adjustment means including a movable action point, said main tube also having an optical axis along which are mounted an objective with an objective image plane and an eyepiece with an eyepiece image plane, an auxiliary tube positioned between said objective and said eyepiece and pivotable about one of its ends for displacement of the other end thereof out of alignment with the axis of said main tube in response to the movement of said action point, and an inverting system arranged within said auxiliary tube, the improvement wherein the portion of said auxiliary tube adjacent said pivot end is formed as a spring joint having sufficient flexibility to permit the displacement of its other end.

4,982,503

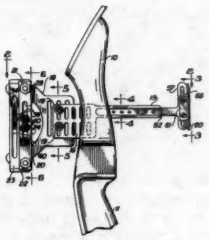
ARCHERY BOW SIGHT

Leo Land, 1777 San Gabriel Dr., Yuma, Ariz. 85365

Filed Sep. 18, 1989, Ser. No. 408,897

Int. Cl.[5] F41G *1/00*

U.S. Cl. 33—265 **7 Claims**



1. For use with an archery bow having a bowstring, an archery bow sight for attachment to an archery bow above the arrow rest and the hand grip portion, said bow sight including an combination:

an elongated support member for attachment to a bow above the arrow rest and having a front portion extending a first predetermined distance in front of the bow and a rear portion extending a second predetermined distance to the rear of the bow, so that no interference between the bow sight and the bowstring occurs;

front sight means including an open, elongated rectangular frame attached to the front portion of said support member;

rear sight means including an open, elongated rectangular frame attached to the rear portion of said support member;

said front sight means including solid horizontal and vertical cross-hairs in the open frame thereof in a plane perpendicular to said support member;

said rear sight means including solid horizontal and vertical cross-hairs in the open frame thereof in a plane parallel to the plane of said front sight means;

means for independently adjusting the angles of the vertical cross-hairs of both said front sight means and said rear sight means relative to the bow to cause such vertical cross-hairs to be parallel to the bowstring and with one another; and

the horizontal and vertical cross-hairs of said rear sight means located to be superimposed with the horizontal and vertical cross-hairs, respectively, of said front sight means in the line of sight of an archer when the archer using the bow has pulled the bow to a full draw and to the archer's normal anchor.

4,982,504

METHOD FOR DETERMINING POSITIONAL ERRORS AND FOR COMPENSATING FOR SUCH ERRORS, AND APPARATUS FOR CARRYING OUT THE METHOD

Bo Söderberg, Köping; Bo Pettersson, Torshälla; Ulf Höcke, Eskilstuna, and Ambjörn Naeve, Stockholm, all of Sweden, assignors to C.E. Johansson AB, Eskilstuna, Sweden

Filed Feb. 17, 1989, Ser. No. 311,950

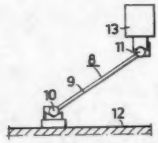
Claims priority, application Sweden, Feb. 18, 1988, 8800566

Int. Cl.[5] G01C *25/00*; G10B *5/03*

U.S. Cl. 33—502 **22 Claims**

1. A method for determining and correcting positional errors which occur when measuring the position of a point in space or when positioning to a point which has a specific position in space, where said position refers to a specific coordinate system, such as a rectangular coordinate system, said method comprising comparing a multiple of measured values with at least one reference and determining a correction of

positional errors on the basis of the comparison, and moving a positionable member to a given position in space during said measuring or defining process, characterized in that said reference is a geometry of known kind, and in that the correlation is used to calculate corrections for the coordinate axes (3, 6, 7) of the system, and wherein linear errors and non-linear errors



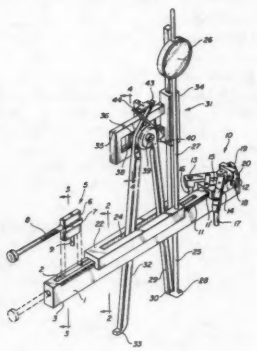
are made the basis of said correction, where, for the purpose of determining corrections with respect to non-linear errors or deviations, several geometries are used, the differences between said different geometries being such as to enable detection of the influence of non-linear errors or deviations on the measured values.

4,982,505

GAUGE FOR MEASURING BOTH THE DEPTH AND THE DIAMETER OF A BORE HOLE

Silvano Pocci, 9 Eric Dr., Kinnelon, N.J. 07405

Filed Apr. 16, 1990, Ser. No. 516,088
Int. Cl.[5] G01B *5/12, 5/18*
U.S. Cl. 33—542 **20 Claims**



1. A gauge for measuring both the depth and the diameter of a bore hole comprising:

first means having a first longitudinal slot therethrough and a surface perpendicular to said first slot to engage the face of said bore hole;

second means slidably engaging said first slot adjacent one end thereof having a first protrusion extending below said surface;

third means slidably engaging said first means adjacent the other end of said first slot having first and second members each disposed at a given angle with respect to and on opposite sides of said first means, each of said first and second members having a second protrusion extending below said surface;

said first protrusion and said second protrusions engaging a selected one of an inner surface of said bore hole and an outer surface concentric with said inner surface of said bore hole to cooperate in aligning said first means with the center line and the diameter of said bore hole;

fourth means slidably engaging said first slot and said first means to measure the depth of said bore hole; and

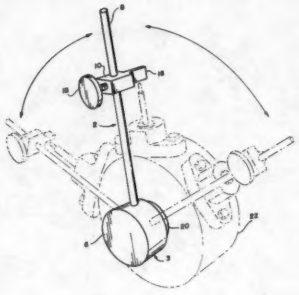
fifth means slidably engaging said first slot and a first portion of said fourth means and having a first portion thereof pivotably connected to a second portion of said fourth means and a second portion thereof slidably engaging a third portion of said fourth means to measure the diameter of said bore hole.

4,982,506

TURRET TOOL MEASURING DEVICE

Robert S. Ross, 6651 Etiwanda Ave., #11, Reseda, Calif. 91335

Filed Nov. 13, 1989, Ser. No. 435,665
Int. Cl.[5] B23Q *17/22;* B27G *23/00*
U.S. Cl. 33—626 **5 Claims**



1. A measuring device for use in connection with a screw production machine, including a turret, a turret hub and a plurality of releasable turret tools, comprising:

a. a slidingly insertable annular member for engaging the hub;

b. a flange member formed integrally with said annular member, said flange member having a means therein to receive a rod member;

c. a rod member insertable in said flange member;

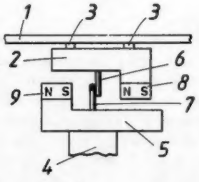
d. a guide means mountable on said rod member and having an opening therein conformed to slidably receive said rod member, said guide means including also an arm member extending therefrom and a cooperating locking element adapted to fixedly secure said guide means to said rod member.

4,982,507

LENGTH MEASURING SYSTEM

Heinz Rieder, Oberndorf, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF-Elektronik Gesellschaft m.b.H., Tarsdorf, Austria

Filed Jan. 22, 1990, Ser. No. 467,944
Claims priority, application Austria, Feb. 10, 1989, A285/89
Int. Cl.[5] G01B *7/04*
U.S. Cl. 33—702 **19 Claims**



1. In a length measuring system comprising an elongate scale member,

track means, which are parallel to the longitudinal direction of said scale member,

a scanning unit, which is mounted to be movable along said scale member and is guided by said track means in said longitudinal direction,

an actuating member for moving said scanning unit along said scale member, and

a backlashfree coupling, which connects said actuating member to said scanning unit and permits said actuating member to move relative to said scanning unit in a direction which is transverse to said longitudinal direction and comprises two coupling elements, which are connected to said scanning unit and to said actuating member, respectively, and have engaging surfaces, which are substantially in point contact with each other and are curved about crossing axes, which are substantially normal to said scale member, wherein

biasing means are provided, which act on said scanning unit and said actuating member and urge said coupling elements against each other,

the improvement residing in that

said biasing means comprise at least one permanent-magnetic biasing set, which consists of a permanent-magnetic part and a second part, which parts are connected to said scanning unit and to said actuating member, respectively and exert magnetic forces on each other.

4,982,508

POSITION MEASURING DEVICE

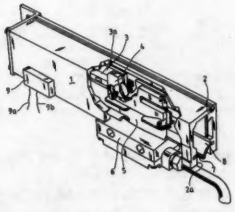
Günther Nelle, Bergen; Walter Schmitt, Traunreut; Reinhold Schopf, Altenmarkt, and Josef Weiss, Traunreut, all of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 370,273

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821860; Jul. 16, 1988, 3824194; Feb. 25, 1989, 3905897

Int. Cl.[5] G01B *11/04*

U.S. Cl. 33—702 **56 Claims**



1. In a position measuring device including a scale carrier member for a scale and a scanning device for scanning the scale, the improvement comprising means for generating a temperature difference between one of the scale carrier member and the scanning device, on the one hand, and the immediate surrounding of the scale carrier member and the scanning device, on the other hand, for producing a condensate.

4,982,509

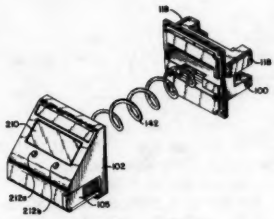
MEASUREMENT SYSTEM HAVING MULTIPLE DISPLAY ORIENTATIONS

David J. Luttmer, Glenshaw; Thomas L. Panian, Allison Park; Barry D. Wixey, and Raymond L. Wilson, both of Pittsburgh, all of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Aug. 19, 1988, Ser. No. 233,498

Int. Cl.[5] G01B *7/04*

U.S. Cl. 33—706 **12 Claims**



1. A measurement system, comprising:

(a) reader head means comprising a reader element configured to move along a calibrated reference member for making an electrically derived measurement relative to the location of the element on the calibrated reference member, said reader head means including means for attaching said reader element to a device for movement along said calibrated reference member which may be positioned in a variety of orientations;

(b) display means for electronically digitally displaying the measurement, the display means comprising flexible coupling means for flexibly connecting the display means to the reader head means so that the display means can display the measurement of the reader head means; and

(c) means for detachably mounting said display means in a preferred reading position on said reader head means in a first reader head orientation when said calibrated reference member is positioned in a first reference member orientation, and means for permitting the detachment of said display means from said reader head means without breaking said coupling means, said means for detachably mounting including means for reattaching said display means on said reader head means in a subsequently preferred reading position after the orientation of said reader head means has changed from said first reader head orientation caused by said calibrated reference member having changed its orientation from said first reference member orientation.

4,982,510

GOLF TEE GAUGE

Robert G. Musillo, 5481 Wolf Dr., Pittsburgh, Pa. 15236

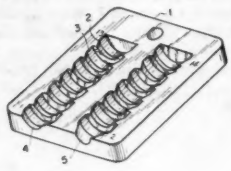
Filed Sep. 28, 1987, Ser. No. 102,002

Int. Cl.[5] A63B *57/00*

U.S. Cl. 33—833 **1 Claim**

1. A one piece, flat, relatively thin, substantially rectangular golf tee gauge having, on one flat surface, two parallel vertical rows of depressions, each corresponding to the shape of the head portion of a golf tee, so that upon manually holding the golf tee against a selected depression, the golf tee may be pierced into the ground to a selected depth beyond the lower

edge of the gauge, the depressions in one row being staggered in relationship to those of the other to enable smaller increments of depth of penetration by moving the golf tee from one row to another.



4,982,511

PROCESS AND APPARATUS FOR KILN-DRYING MALT

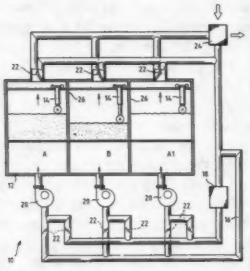
Willi Frei, St. Gallen, Switzerland, assignor to Air Fröhlich Ag fur Energierückgewinnung, Arbon, Switzerland

Filed May 5, 1989, Ser. No. 350,300

Claims priority, application Fed. Rep. of Germany, May 9, 1988, 3815845

Int. Cl.[5] F26B *3/08*

U.S. Cl. 34—33 **22 Claims**



1. A process for the drying of malt in a kiln-drier, in which

(a) there are provided at least two zones for preliminary drying and one zone for secondary drying of the malt and

(b) unsaturated exhaust air from the secondary drying zone is admixed as return air with intake air for preliminary drying,

wherein

(c) in the preliminary drying zones respectively different preliminary drying times are employed, and during the secondary drying in the secondary drying zone, a preliminary drying process always takes place in at least one preliminary drying zone, and

(d) each individual zone is separate as to ventilation from the other zones.

4,982,512

VAPOR RECOVERY SYSTEM

Ronnie G. McClenny, Northport, Ala., assignor to JVC Magnetics America Co., Tuscaloosa, Ala.

Filed Dec. 11, 1989, Ser. No. 448,223

Int. Cl.[5] F26B *21/06*

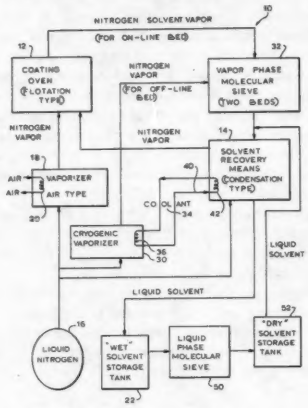
U.S. Cl. 34—77 **10 Claims**

1. A solvent recovery system comprising:

(A) flotation-type coating oven means for evaporating solvent from a coating on a film, said oven means including means for supporting the film on a bed of nitrogen vapor and for discharging a vapor stream including the nitrogen vapor and the solvent vapor;

(B) vapor phase molecular sieve means for drying the vapor stream from said oven means and for discharging a dried vapor stream;

(C) condensation-type solvent recovery means for condensing the solvent vapor in the dried vapor stream from said vapor phase molecular sieve means and for discharging nitrogen vapor and liquid solvent separately; and



(D) cryogenic vaporizer means for converting liquid nitrogen to nitrogen vapor with heat from a heat exchange fluid in heat exchange relationship with the liquid nitrogen, including means for passing the heat exchange fluid from said vaporizer means through said solvent recovery means in heat exchange relationship with the dried vapor stream therein to cool the same.

4,982,513

PROCESS AND DRYER SECTION FOR DRYING A RUNNING WEB IN A PAPER OR BOARD MAKING MACHINE

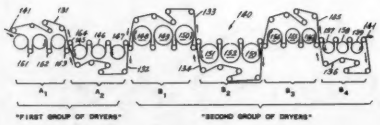
Hans Loser, Langenau; Tri Chau-Huu, and Albrecht Meinecke, both of Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 213,094, Jun. 29, 1988, Pat. No. 4,882,855. This application Aug. 24, 1989, Ser. No. 398,053

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721734

Int. Cl.[5] F26B *13/08*

U.S. Cl. 34—116 **19 Claims**



1. A dryer section of a paper or board making machine, the dryer section comprising:

a series of heated dryers, disposed such that a web to be dried having two sides can be wrapped at least partially around each of the dryers in series, such that the web is heated by each dryer as it moves along the series of dryers;

said series of dryers comprising a first group of dryers having means to heat up the web after entering the dryer section to a level which is below a level of maximum evaporation rate;

a second group of dryers, following said first group of dryers, with each dryer of that second group having means to

heat the web at least to the level of maximum evaporation rate;

at least said second group of dryers including a plurality of subgroups of dryers, and each subgroup having a plurality of dryers;

said second group including a first subgroup of dryers which is positioned substantially where the web enters the second group, and a series of subgroups of dryers in series thereafter in the direction of web travel; at least some of the subgroups of dryers in series after said first subgroup having a smaller diameter than the dryers of said first subgroup;

the number of dryers of said second group being at least equal to the number of dryers of said first group; and

at least said second group of dryers having means for guiding said web such that adjacent subgroups of dryers alternatingly contact opposite sides of the web.

4,982,514

APPARATUS FOR HEATING AND/OR DRYING

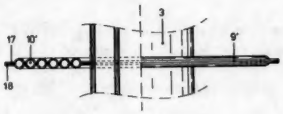
Henrik Ullum, Lykkesholm 1, DK-2690 Karlslunde, Denmark

PCT No. PCT/DK87/00163, § 371 Date Aug. 11, 1989, § 102(e) Date Aug. 11, 1989, PCT Pub. No. WO89/06337, PCT Pub. Date Jul. 13, 1989

PCT Filed Dec. 28, 1987, Ser. No. 382,683

Int. Cl.[5] F26B *11/12*

U.S. Cl. 34—183 **15 Claims**



1. Apparatus for heating and/or drying of wet, comminuted material, said apparatus comprising a stationary housing rotatably accommodating a hollow rotor having an inlet means and discharge means for a heat medium, annular drying elements disposed at intervals along said hollow rotor, and at least two hollow annular channels provided in the annular drying elements to which the heating medium is fed in parallel, wherein each of the annular drying elements comprise two substantially planar plates directly welded to each other so as to be coupled together and to form one drying element, and wherein at least one of the two substantially planar plates is deformed so as to form said at least two annular channels directly in said at least one substantially planar plate.

4,982,515

SHELL STRUCTURE PARTICULARLY FOR SKI BOOTS

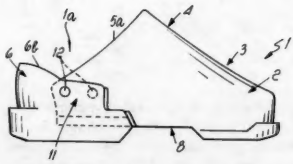
Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed May 8, 1989, Ser. No. 349,195

Claims priority, application Italy, May 20, 1988, 82551 A/88

Int. Cl.[5] A43B *5/004, 3/026*

U.S. Cl. 36—117 **8 Claims**



1. Shell structure for ski boots, comprising at least one first body and at least one second body, a metatarsal region being defined by said at least one first body, a foot instep region being defined by said at least one first body, said at least one first body encompassing said metatarsal region and said foot instep region, a heel region being defined by said at least one second body, said at least one second body encompassing said heel region, wherein said shell structure further comprises guiding means and coupling means, said guiding means being associated with said at least one first body and with said at least one second body, a telescoping coupling of said at least one first body with said at least one second body being provided by said guiding means, said guiding means stiffening and mutually centering said at least one first body and at least one second body to thereby provide said shell structure, said coupling means being associated with said at least one first body and with said at least one second body, a rigid coupling of said at least one first body with said at least one second body being provided by said coupling means, said at least one first body and said at least one second body being individually manufactured by separate molding, said coupling means comprising a plurality of rivets, said plurality of rivets being constituted by a first pivoting element and a second pivoting element, said first pivoting element being associable with said at least one first body, said second pivoting element being associable with said at least one second body, whereby said first pivoting element and said second pivoting element act as pivot points for respective quarters of ski boot.

4,982,516

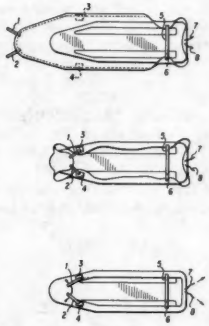
ADJUSTABLE IRONING TABLE COVER

Ignacio Cervantes, Henry Ford, Mexico, assignor to Cia, Manufacturera Erc, S.A., de C.V., Mexico, Mexico

Continuation of Ser. No. 294,462, Jan. 6, 1989, abandoned. This application Nov. 30, 1989, Ser. No. 443,863

Int. Cl.[5] D06F *83/00*

U.S. Cl. 38—140 **5 Claims**



1. An adjustable ironing board cover, which comprises:

a cloth having a rounded nose portion, substantially rectangular side and rear portions and a hem continuously bordering a perimeter portion of the cloth along the rounded nose and rectangle side portions;

a drawstring fitted within said hem to exit at the rear portion; and

a plurality of securing members located near an apex portion of said rounded nose portion of said cloth and along said side portions, wherein, when the ironing board cover is fitted on a board shorter than said cover said nose portion is dimensioned so as to extend forward of a nose portion of the ironing board, so that said cover nose portion is adapted to be folded back so as to extend under the ironing board toward the rear portion such that said apex portion securing members are engageable with the secur-

ing members of said side portions so as to secure said cover to said board.

4,982,517

SNAP-TOGETHER PICTURE FRAME

Raymond Bilodeau, 28 Sage Ave., Leominster, Mass. 01453

Continuation-in-part of Ser. No. 367,145, Jun. 16, 1989, abandoned. This application May 7, 1990, Ser. No. 520,840

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—155 **6 Claims**

1. A one piece picture frame component for forming one entire side of a picture frame, said component comprising: an elongated member of a length which substantially conforms to the length of one side of a picture to be framed, said member having opposed beveled ends, and inner, medial and outer flanges which form two adjacent channels on a back side of the member, which channels have open ends formed at said opposed beveled ends; a U-shaped channel component permanently secured in one of said elongated member channels and extending therefrom at right angles to the axis of elongation of the elongated member, said channel component having a transverse outer dimension substantially equal to the transverse inner dimension of said one of said elongted member channels; a resilient latch element permanently mounted in said channel component, said latch element extending toward an open end of said channel component, and said latch element having a hook part facing toward said elongated member, and a camming surface facing away from said elongated member; and a catch plate permanently mounted on said medial flange and extending across said one of said elongated member channels at an end thereof opposite said channel component.

4,982,518

UNDER-PHONE TELEPHONE INDEX

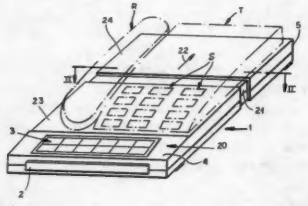
Gerhard Guenther, Mettmann, Fed. Rep. of Germany, assignor to Exim Design Handelsgesellschaft mbH, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,194

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734731

Int. Cl.[5] B42F *17/34*

U.S. Cl. 40—371 **4 Claims**



1. An under-phone telephone index, comprising:

a housing having an upper part forming a resting surface upon which a telephone can be seated and comprising at least two members interconnected so that one of said members can be shifted away from the other of said members to extend the area over which said telephone is supported by said surface, said resting surface being formed on each of said members and in a contracted position being flush from one member to another; and

a drawer slidable into and out of said housing and adapted to receive cards carrying telephone numbers.

4,982,519

IDENTIFICATION DEVICE FOR FUEL INJECTION VALVES

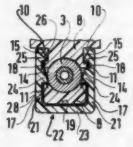
Waldemar Hans, Bamberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,510

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 8801817[U]

Int. Cl.[5] G09F *3/16*

U.S. Cl. 40—666 **20 Claims**



1. An identification device for use in combination with a fuel injection valve, said identification device **(22)** is U-shaped in embodiment and has two oppositely disposed legs **(21)** originating at a bottom **(23)** and spaced apart from one another, each of said legs include an inner surface, face, at lest one of said legs is provided with at least a first snap-in means on a portion of said inner surface face thereof, said fuel injection valve includes at least one second snap-in means, and said identification device encompasses a portion of said fuel injection valve **(1)** including said at least one second snap-in means and is joined to said injection valve via said at least one second snap-in means **(14, 15, 17, 18)** formed on a portion of said fuel injection valve **(1)** in which said at least first snap-in means interfits, said first snap-in means and said second snap-in means are embodied as a protrusion and/or indentation.

4,982,520

SEMI-AUTOMATIC PISTOL MAGAZINE

Jong W. Lee, 221 S. Norton Ave., Los Angeles, Calif. 90004

Filed Jan. 30, 1989, Ser. No. 304,063

Int. Cl.[5] F41A *9/61*

U.S. Cl. 42—49.01 **9 Claims**

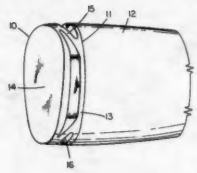
7. A semi-automatic pistol magazine comprising: a cylinder containing a plurality of bullets substantially aligned along longitudinal axes in which one end of said cylinder fastens into the bottom of a pistol grip and the other end curves upwardly above the lower end of the pistol grip; and a pistol magazine receptacle having a curvature which hugs the back of a user's hand.

4,982,521

RECOIL SHOCK RELIEVING PAD FOR RIFLES

Fred A. Sutton, Auburn, Wash., and Marc H. Ratzlaff, Moscow, Id., assignors to Technology Innovations, Inc., Renton, Wash.

Filed May 21, 1990, Ser. No. 526,438
Int. Cl.[5] F41C *23/08*
U.S. Cl. 42—74 **2 Claims**



1. A pad for attachment to the ends of butts of rifles and shotguns, said pad comprising:

a working part having a longitudinal axis, a first end, a second end, a first planview profile and a base, said base having a second planview profile and being essentially a flat plate,

a first strut being essentially a flat plate,

a second strut being essentially a flat plate,

said working part and said base being positioned essentially parallel to each other with said first planview profile centered with said second planview profile,

said first strut being oriented at 90° to said longitudinal axis and extending from said first end of said working part to said base at a first angle to said base, said angle being in the range of 30° to 50°,

said second strut being oriented at 90° to said longitudinal axis and extending from said second end of said working part to said base at a second angle to said base, said angle being in the range of 30° to 50°,

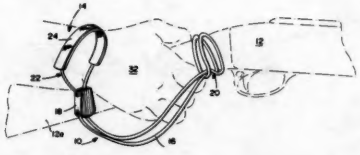
said first and second struts being angled toward each other from said first and second ends.

4,982,522

GUN SAFETY LANYARD

Don S. Norton, Clinton, Miss., assignor to Brell Mar Products, Inc., Jackson, Miss.

Filed Mar. 13, 1990, Ser. No. 492,917
Int. Cl.[5] F41C *23/02*
U.S. Cl. 42—85 **5 Claims**



1. The combination comprising (1) a gun which includes a gun barrel and a shoulder stock, said shoulder stock having a butt end and a hand grip forwardly of said butt end and (2) a gun safety lanyard operatively associated with said shoulder stock, wherein said gun safety lanyard includes;

an endless loop of flexible cord having a preselected length; and

slide clasp means operatively associated with said endless loop of flexible cord for establishing first and second opposing sub-loops, wherein

said first sub-loop encircles a rearward portion of said shoulder stock forwardly of said butt end thereof, and said second sub-loop encircles said hand grip of said shoulder stock forwardly of said rearward portion of said shoulder stock such that said preselected length of said flexible cord is substantially taunt between said rearward portion and said hand grip of said shoulder stock to thereby retain said gun safety lanyard in a stowed condition relative to said shoulder stock, and wherein

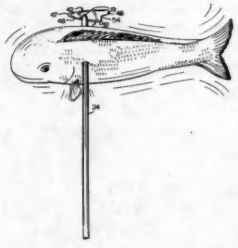
said slide clasp means is slidably movable along the length of said flexible cord to increase the size of said first sub-loop to allow said first sub-loop to be removed from said rearward portion of said gun stock and to thereby allow said first sub-loop to be attached to a hunter, whereby the gun may be tethered to the hunter so as to minimize droppage of the same and thereby provide a measure of increased safety against accidental gun discharge.

4,982,523

SPEAR-HEAD AND SHANK ASSEMBLY FOR SPEARFISHING

John B. Garton, R. R. #2, Jasper, Canada

Filed Nov. 30, 1989, Ser. No. 443,323
Int. Cl.[5] A01K *81/00*
U.S. Cl. 43—6 **7 Claims**



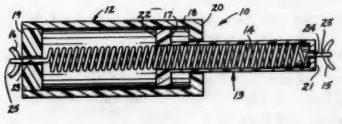
4. The invention according to claim 3 wherein said predetermined distance is about 1/16 of an inch.

4,982,524

FISHING HOOK RELEASE

E. D. Vissing, P.O. Box 50475, Idaho Falls, Id. 83405

Filed Oct. 13, 1989, Ser. No. 421,183
Int. Cl.[5] A01K *91/00, 97/00*
U.S. Cl. 43—42.02 **5 Claims**



1. A snagged fish hook release adapted to be connected between a hook or lure and a line on fishing tackle, comprising:

(a) a tubular outer sleeve having a closed end and an open end;

(b) a tubular inner sleeve having a closed end and an open end, the inner sleeve slidably fitting coaxially within the outer sleeve, the closed ends of the outer and inner sleeves being arranged at opposite ends of the device;

(c) first and second coupling means extending outward at the closed ends of the outer and inner sleeves for attaching them top a hook or lure and a line; and

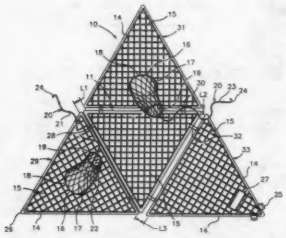
(d) resilient means positioned coaxially within the inner sleeve and having opposite ends operably connected to the respective closed ends of the outer and inner sleeves for normally biasing the inner sleeve to a retracted position within the outer sleeve.

4,982,525

COLLAPSIBLE LOBSTER OR CRAB TRAP

James S. Miller, 13357 Portofino Dr., Del Mar, Calif. 92014

Filed Jul. 5, 1990, Ser. No. 548,603
Int. Cl.[5] A01K *69/10*
U.S. Cl. 43—105 3 Claims



1. A collapsible trap comprising:

a. a base frame member having a three-sided, rod-like frame;

b. three side frame members having a three-sided, rod-like frame;

c. each one of the three side frame members hingedly attached to a respective side of the base frame member so that all three sides of the base frame member hingedly support a side frame member;

d. a mesh material connecting the sides of the base frame member and connecting the side frame members individually and covering the inner area enclosed by the sides of each of the base frame and side frame members;

e. at least one entrance port in the mesh of at least one of the side frame members;

f. an interior net having a truncated cone shape and attached to the circumference of the entrance port and the interior net having a larger opening at the end attached to the entrance port than at a distal end, and the interior net having a means to support the net while inside the trap;

g. a securing means to releasingly secure apexes of the side frame members in a closely engaged position in order to maintain a pyramidal enclosure and to maintain the side frame members and the base frame member in a storage configuration; and

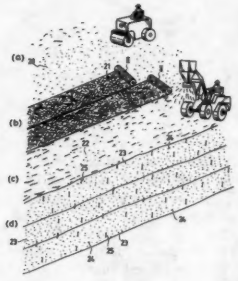
h. a gripping means in the mesh of one of the side frame members to lift the base and side frame members and to hinge one of the side frame members away from the other side frame members, while in the pyramidal configuration, to gain access to the pyramidal enclosure formed by the base frame member and the side frame members.

4,982,526

MAT-LIKE LAWNGRASS FOR TRANSPLANTATION AND METHODS OF MANUFACTURE AND TRANSPLANTATION OF THE SAME

Yoshifumi Miyachi, Hiroshima, Japan, assignor to Sanyo Turk Co., Ltd., Hiroshima, Japan

Filed Dec. 14, 1989, Ser. No. 450,554
Claims priority, application Japan, Aug. 6, 1989, 1-203568; Dec. 9, 1989, 1-319580
Int. Cl.[5] A01G *1/00*
U.S. Cl. 47—56 14 Claims



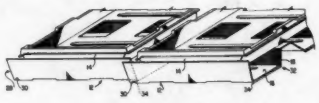
1. Mat-like lawngrass for transplantation comprising runner-like grass of a predetermined density or thickness obtained by fraying out sod pieces and sandwiched between a net and a cover member.

4,982,527

SEEDLING PROPAGATION ASSEMBLY

Philip D. Sprung, c/o 1001-10th Avenue, S.W., Calgary, Alberta, Canada T2R 0B7

Continuation of Ser. No. 947,637, Dec. 30, 1986, abandoned.
This application Oct. 25, 1988, Ser. No. 262,472
Int. Cl.[5] A01G *31/00, 9/02;* E02B *5/00*
U.S. Cl. 47—59 12 Claims



1. A propagation tray for a seedling propagation assembly comprising

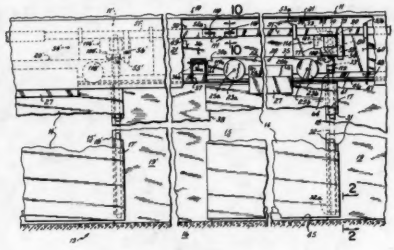
a lower plant support section having at least one channel for a gravity flow of nutrient solution in film form from an inlet end thereof to an outlet end thereof and a plurality of integral raised support strips on a floor of said channel for supporting growth blocks thereon in spaced relation to said floor to permit the growth blocks to draw nutrient solution from said flow with minimal resistance to said flow; and

an upper spacer section mounted on said lower section, said upper spacer section having a plurality of openings, each said opening disposed above at least one of said support strips for respectively receiving and laterally supporting the growth blocks therein.

4,982,528
PRISON CELL LOCKING AND UNLOCKING DEVICE

Justin F. Michel, 5526 Pinecrest Dr., Cincinnati, Ohio 45238

Filed Nov. 29, 1988, Ser. No. 277,303
Int. Cl.[5] E05B 47/00
U.S. Cl. 49—16 21 Claims



1. A prison cell door locking system for controlling the door locks of a plurality of cells arranged in at least one row, wherein the cell of the row has a cell frame, said system comprising:

a plurality of cell door locking and unlocking devices, one at each cell of said row;

a central control location;

a longitudinally movable master control bar assembly operable from said control location and extending horizontally along each cell of the row for simultaneously controlling the operation of said cell door locking and unlocking devices at each of the cells of the row;

said master bar assembly including a plurality of horizontal master bar sections, one at each of said devices and operatively linked thereto and slidably mounted on to said frame; and,

said master bar assembly further including a floating horizontal master bar link rigidly connected at each end to the ends of adjacent master bar sections of the cell door locking and unlocking devices of adjacent cells;

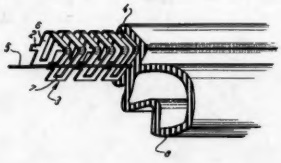
said master bar section being shorter than said master bar link; and

said master bar link being a hollow light weight channel with external cross-sectional dimensions greater than those of said master bar sections.

4,982,529
SEAL STRUCTURES, PARTICULARLY FOR AUTOMOBILE BODYWORK

Francois Mesnel, Neuilly S/Seine, France, assignor to Mesnel S.A., Carrieres S/Seine, France

Filed Jul. 19, 1989, Ser. No. 382,123
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—491 9 Claims



1. An apparatus, comprising:

a profile for a seal, comprising:

a metal reinforcement having a U-shaped cross-section with two substantially straight branches terminating in free ends and a bight connecting said two branches, said metal reinforcement including a succession of U-shaped rectangular elements having long sides perpendicular to the plane of symmetry of the U and short sides parallel to this plane of symmetry, said rectangular elements being joined to adjacent rectangular elements by two spacers parallel to the plane of symmetry of the U and the short sides and positioned, respectively, in said branches spaced from said free ends, these spacers being arranged symmetrically relative to the plane of symmetry of the U and being offset from the short sides so that a continuous space results between each pair of long sides through the bight of the metal reinforcement and alternate spaces result between the long sides at said free ends of the branches of the U, where the rectangular elements and the long sides of the rectangular elements are separated by a distance of less than about 1.5 mm; and

a covering on said metal reinforcement, said covering filling the spaces between said rectangular elements and the long sides of the rectangular elements to provide a smooth outer appearance without ripples;

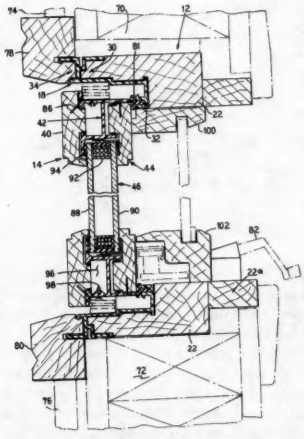
a sealing element attached to said covering; and

at least one virtually inextensible filament in an intermediate zone proximate said spacers.

4,982,530
EXTRUDED CORE SECTIONS FOR WOOD FENESTRATION MOUNTING FRAMES AND SASHES

Douglas J. Palmer, Mosinee, Wis., assignor to SNE Enterprises, Inc., New York, N.Y.

Filed Oct. 14, 1988, Ser. No. 257,769
Int. Cl.[5] E06B 1/04
U.S. Cl. 49—504 13 Claims



1. A fenestration for a building having a fenestration-receiving opening therein, which includes:

a mounting frame assembly for fitting within the building opening; and

a glazed sash assembly which fits within the mounting frame and includes a sash and a glazing carried by the sash;

wherein the improvement comprises:

said mounting frame having head, sill and side jamb members, each of which includes interior members, exterior members and a shaped extruded plastic core having means for securement to interior member and means for securement to said exterior members;

said sash having head, sill and stile members, each of which includes interior members, exterior members, glazing and a shaped extruded plastic core having means for securement of said interior members thereto, means for securement of said exterior members thereto and means for

securement of said glazing thereto; and wherein each of said sash and frame interior and exterior members are selected from a group of members having a plurality of predetermined surface finishes;

said sash core extrusion has an I-beam-like shape which includes a central web, outer exterior and interior flanges, and inner exterior and interior flanges, and said inner exterior flange having an inwardly extending wall formation;

said outer interior flange, web and inner interior flange defining said interior frame receiving portion;

said outer exterior flange, web and inner exterior flange defining said exterior frame receiving portion; and

said inner flanges and inwardly extending wall formation defining said glazing receiving portion.

4,982,531

METHOD EMPLOYING ABRASIVE TOOLS FOR THE COMBINED CUTTING AND TRIMMING OF GLASS OR CRYSTAL ARTICLES AND AN APPARATUS FOR CARRYING OUT THE SAID METHOD

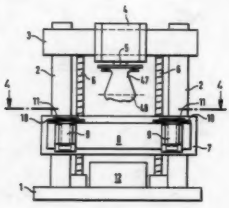
Leon Biebuyck, Obourg, Belgium, assignor to Etablissements Biebuyck S.A., Houdeng-Goegnies, Belgium

Filed May 24, 1989, Ser. No. 356,744

Claims priority, application Belgium, May 26, 1988, 08800583

Int. Cl.[5] B24B *9/12*

U.S. Cl. 51—283 E **4 Claims**



1. A method of cutting a moil from a glass article having a first axis and trimming a cut portion of the article from which the moil has been cut, comprising the steps of:

(a) holding said article with said first axis disposed vertically and said moil disposed at a bottom of the article;

(b) displacing respective abrasive moil-cutoff disks rotating about respective second and third vertical axes horizontally into said article from opposite sides and in opposite directions and rotating said article about said first axis to cut off said moil and produce a cut edge on said article adjacent a cut portion thereof while maintaining said disks in respective upper limiting positions along the the respective second and third vertical axes, each of said disks having a respective abrasive finishing wheel formed along an upper surface thereof and rotatable with the respective disk;

(c) lowering said disks to respective lower limiting positions along the respective second and third vertical axes, thereby juxtaposing said finishing wheels with said article; and

(d) displacing said wheels against said article while rotating said wheels about the second and third axes of said disks and rotating said article about said first axis to trim said cut portion of said article.

4,982,532

METHOD AND APPARATUS FOR FINISHING GEAR TOOTH SURFACES OF A BEVEL GEAR

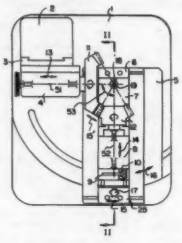
Norio Hosoya, Fuchu, and Shigeyuki Yoneyama, Hachioji, both of Japan, assignors to Ken-Ichi Hattori, Alexandria, Va.

Filed Aug. 11, 1989, Ser. No. 392,248

Claims priority, application Japan, Sep. 1, 1988, 63-218830

Int. Cl.[5] B24B *19/00*

U.S. Cl. 51—287 **12 Claims**



1. A method for finishing involute gear tooth surfaces of bevel gears, comprising the steps of:

rotatably supporting a first bevel gear;

rotatably supporting a second bevel gear in a meshing fashion with said first bevel gear in a manner such contacting involute gear tooth surfaces of said first and second bevel gears contact each other through a shifting contact point therebetween and further that a pitch apex of said first bevel gear coincides with that of said second bevel gear;

rotating at least one of said first and second bevel gears while providing a brake force therebetween; and

providing at least one of said first and second bevel gears with a rocking arc motion around the pitch apex thereof such that the relative rocking motion between said contacting involute gear tooth surfaces at any position of said shifting contact pint swings along an arc extending along a tooth profile direction extending between a tooth top and a tooth root of a gear tooth of each of said contact involute gear tooth surface,

wherein said contacting gear tooth surfaces are finished by both rotational contact therebetween and sliding contact by said relative rocking motion.

4,982,533

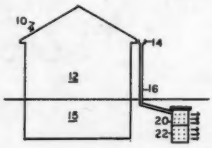
DRYWELL WITH PLUGS, DRYWELL SYSTEM AND METHOD FOR CONTROLLING THE FLOW AND DIRECTION OF SURFACE WATER

Thomas Florence, 817 Shoot Flying Hill Rd., Centerville, Mass. 02632

Continuation-in-part of Ser. No. 394,635, Aug. 16, 1989, Pat. No. 4,983,069. This application Sep. 14, 1989, Ser. No. 407,361

Int. Cl.[5] E02B *11/00, 19/00;* E03F *5/02*

U.S. Cl. 52—169.5 **15 Claims**



1. A drywell drainage system for the subterranean collection

and distribution of surface water to a drain field or water deficient-user lawn or garden system, which system comprises:

(a) a water source of surface water to be collected and subterraneally flow-distributed away from the water source;

(b) a cyindrical drywell positioned beneath the ground and having a cylindrical wall;

(i) at least one large diameter inlet or outlet port in the cylindrical wall of the drywell to receive or discharge the surface water;

(ii) a plurality of distribution ports having a smaller diameter than the said large diameter port generally uniformly distributed about the periphery and the length of the cylindrical wall surface of the drywell;

(ii) a removable bottom cover;

(iv) a removable top cover; and

(v) a plurality of enclosure plug means for use in plugging a selected number of the smaller diameter distribution ports, the plugs adapted to be easily installed in or removed from the distribution ports prior to use of the drywell whereby on selection of the drain ports, the direction, level and distribution pattern of the flow of surface water discharged from the cylindrical wall of the drywell may be controlled by the selection of the plugs installed or removed;

(c) means to direct the flow of surface water from the water source into the drywell.

4,982,534

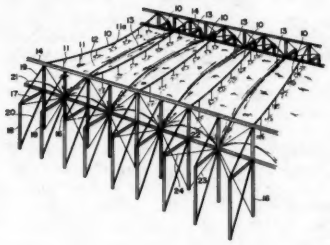
SUSPENDED MEMBRANE STRUCTURE

Masao Saitoh, Urawa; Katsuhiko Endo, Tokyo; Yuzo Endoh, Urawa; Takeshi Kuroda, Miyoshi; Makoto Saito, Higashimurayama, and Kenzo Shinkubo, Kiyose, all of Japan, assignors to Mitsui Construction Co., Ltd., Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,200

Int. Cl.[5] E04B *1/347*; E04C *3/02*

U.S. Cl. 52—63 **7 Claims**



1. A suspended membrane structure comprising:

a plurality of suspending members each having ends and arranged in substantially parallel or substantially radial fashion, a prestress being applied to each of said plurality of suspending membranes at respective ends thereof;

a membrane suspended beneath said plurality of suspending members and forming a membrane surface;

a plurality of tie cables for attaching the membrane at a support point to each of the plurality of suspending members in a point support fashion from a plurality of points on each suspending member; and

a plurality of bracing cables each having ends and each being provided on the membrane in a same direction as that of said suspending member at each middle position between adjacent suspending members, and capable of imparting a tensile force to said membrane;

wherein said membrane sags between respective support points at which said membrane is attached to said tie cables to form substantially conical peaks at each of the respective support points, and the membrane surface as a whole is formed as a curved surface with a small rise having a small outward swell; and

wherein said plurality of suspending members are slidable along first beams provided at respective ends of said plurality of suspending members, and said plurality of bracing cables are slidable along second beams provided at respective ends of said plurality of bracing cables, and a driving member, with a given stiffness, provided at one of said first beams and said second beams and slidable therealong is moved by a given drive unit, thereby making said membrane capable of being opened or closed together with said plurality of suspending member and said plurality of bracing cables.

4,982,535

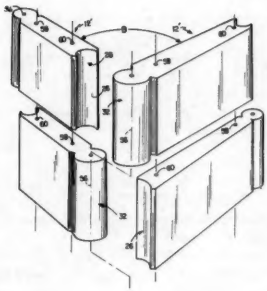
BARRIER STRUCTURE

William H. Pickett, 4331 Marjoram Ct., Alexandria, Va. 22313

Filed Apr. 10, 1989, Ser. No. 335,546

Int. Cl.[5] E04H *17/14*

U.S. Cl. 52—71 **19 Claims**



1. A free standing barrier structure comprising

two or more modular panels of height and length significantly greater than thickness, disposed to extend generally along a fence line, and

a connector assembly for pivotal joining of adjacent modular panels, each said connector assembly comprising a cylinder element of a first diameter and having an upper surface and a lower surface, a rod element of a second diameter relatively smaller than said first diameter, and means for joining said cylinder element and said rod element in coaxial arrangement,

each said modular panel defining at least three, horizontally spaced apart, vertical tunnels, at least one said vertical tunnel defined by said modular panel adjacent each end of said modular panel, each said horizontally spaced apart, vertical tunnel defining a first portion of size and a first diameter for receiving the cylinder element snugly therewithin and further defining a second portion, vertically coaxial with said first portion, of a second diameter smaller than said first diameter for receiving said rod element snugly therewithin, and

means for joining connectors in horizontally spaced apart vertical tunnels of adjacent modular panels.

4,982,536

CONDUIT DEVICE IN A WINDOW PARAPET

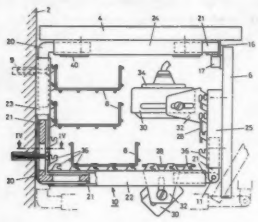
Erhard Muhlethaler, Schalunen, Switzerland, assignor to Lanz Oensingen AG, Oensingen, Switzerland

Filed Dec. 5, 1989, Ser. No. 446,257

Claims priority, application Switzerland, Dec. 22, 1988, 4743/88

Int. Cl.[5] E04B *5/48*; H02G *3/04, 3/10*

U.S. Cl. 52—220 16 Claims



1. A parapet channel device comprising:

a plurality of longitudinally extending interior supporting conduits adapted for supporting wires, cables and tubings,

a plurality of rectangular frames disposed at a distance from each other along said supporting conduits in planes parallel to each other, said frames being adapted for being fastened to a wall at one of their sides and for the fastening exterior facing panels on at least two of their remaining sides;

one of the sides of each frame being connected to an adjoining side by means of a hinge to render it pivotable outwardly of the frames, and

said frames being further provided with fastening means for interchangeably fastening said longitudinally extending supporting conduits at selected places along the interior sides of the frames.

4,982,537

DEVICE FOR JOINING TWO BUILDING UNITS

Jukka Matikainen, Hämeenlinna, Finland, assignor to Oy Lohja AB, Virkkala, Finland

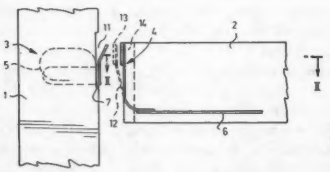
PCT No. PCT/FI88/00069, § 371 Date Nov. 6, 1989, § 102(e) Date Nov. 6, 1989, PCT Pub. No. WO88/08904, PCT Pub. Date Nov. 17, 1988

PCT Filed May 4, 1988, Ser. No. 435,368

Claims priority, application Finland, May 6, 1987, 872001

Int. Cl.[5] E04B *1/21, 1/24*

U.S. Cl. 52—251 7 Claims



1. A device for joining two building units including a first anchoring means cast integrally with a first building unit and a second anchoring means cast integrally with a second building unit, said first anchoring means comprising: a supporting plate positioned on a surface of said first building unit in parallel therewith and having a bearing surface extending substantially perpendicular to said surface, said first anchoring means further having a plate-like joining means attached to said supporting plate and extending upward and outwardly from said bearing surface and forming a pocket adapted to receive said second anchoring means, said second anchoring means comprising: a loop formed by two spaced parallel arms having lower ends cast integrally with said second building unit and upper ends projecting from said second building unit and joined by means of a transverse plate and said loop adapted to receive said plate-like joining means with said transverse plate received in said pocket.

4,982,538

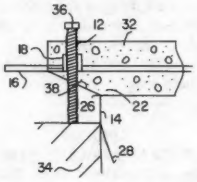
CONCRETE PANELS, CONCRETE DECKS, PARTS THEREOF, AND APPARATUS AND METHODS FOR THEIR FABRICATION AND USE

Eugene A. Horstketter, P.O. Box 441282, Houston, Tex. 77244

Continuation-in-part of Ser. No. 83,663, Aug. 7, 1987, abandoned. This application Aug. 2, 1989, Ser. No. 388,475

Int. Cl.[5] E04B *1/00, 1/38*

U.S. Cl. 52—259 13 Claims



1. A precast concrete panel with a top and a bottom adapted to be assembled above a beam with one side edge thereof overlapping a side edge of the beam, whereby concrete or grout may be introduced through an end of a space between the bottom of the panel and the top of the beam which is adjacent the one side edge of the panel so as to support the panel from the beam, and a thin, elongate strip having

hinge means along a length of the strip intermediate elongate portions on opposite sides of the hinge means, and

anchor means on an upper face of the strip adjacent the hinge means and cast into the bottom of the panel at a location which disposes the hinge means approximately over the side edge of the beam,

said strip being formed of a relatively stiff material and said hinge means being formed integrally with the elongate portions of the strip to dispose said portions in general alignment with one another, when the hinge means is unstressed, whereby the upper face of the strip may provide part of a form for the bottom of the panel during casting, and

said hinge means being flexible to enable an inner elongate portion of the strip to be swung downwardly and outwardly to a position, whereby the panel may be assembled over the beam into a position in which said upper face of the inner elongate portion is yieldably urged against and slidable over the side edge of the beam so as to resist the outward force of the concrete or grout entering the space.

4,982,539

GRID GIRDER FOR RAISED FLOORS

Wolfgang Hiller, Laudenbach, Fed. Rep. of Germany, assignor to Mero-Werke, Fed. Rep. of Germany

Filed Oct. 4, 1989, Ser. No. 417,052

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833875

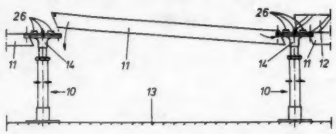
Int. Cl.[5] E04B *5/43*

U.S. Cl. 52—263 4 Claims

1. Grid girder assembly for raised floors, comprising legs which incorporate cover plates for connection to the grid girders which are of substantially rectangular construction for

the support of floorboards laid on the grid girders, and the cover plates of the legs are provided on their periphery with pairs of recesses and boreholes therebetween to receive the ends of the grid girders, characterized in that

(a) the grid girder (**11**) has side walls (**17**) with ends (**18**) which are beveled in such a manner that, when viewed from the side, the girder has the shape of a parallelogram, and



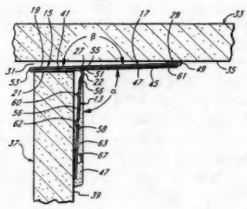
(b) the grid girder (**11**) has upper and lower walls (**19, 20**) lying opposite and facing one another, the upper wall (**19**) of the grid girder having oblong apertures (**21**) at both ends thereof for the passage of fastening screws therethrough and into the boreholes on the cover plates to secure the grid girder thereto, and the lower wall (**20**) of the grid girder having inwardly extending tongues (**22**) at both ends thereof of a size to be received within the boreholes on the cover plates.

4,982,540

TRIM PIECE FOR SUSPENDED CEILINGS

Roger L. Thompson, 25621 Dillon Rd., Laguna Hills, Calif. 92653

Filed Aug. 25, 1989, Ser. No. 398,634
Int. Cl.[5] E04B *5/57*
U.S. Cl. 52—287 **6 Claims**



1. A ceiling trim system, comprising:

a substantially vertical wallboard partition having a substantially vertical outer surface and a substantially horizontal top surface;

a substantially horizontal ceiling panel having a horizontal bottom surface, said top surface of said wallboard partition and said bottom surface of said ceiling panel forming a gap between one another; and

a metal trim piece insertable into said gap for purposes of covering said gap and providing an aesthetically pleasing trim strip along said partition, comprising:

a generally horizontal capping flange turned downward against itself creating an upper layer and a lower layer insertable into said gap, said upper and said lower layer forming a sideways "U" with an included angle of approximately 180°, said sideways "U" including an open end and closed end;

a generally horizontal trim flange having a painted lower surface which forms an angle of approximately 180° with said upper layer of said capping flange, said trim flange and said capping flange integrally joined along a junction which is at least as strong as said trim flange to form a continuous planar strip, said trim flange including a raised shoulder opposite said capping flange which forms an outer edge;

a generally vertical stem having an upper end and a lower end; and

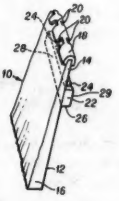
an elongate horizontal lip having an upper portion and a lower portion providing a guide for the application of masking compound over said stem, said upper portion being integrally joined with said lower layer of said capping flange and said lower portion being integrally joined with said upper end of said stem, said stem forming an included obtuse angle with said trim flange which facilitates the application of masking compound over said stem.

4,982,541

SHINGLE OR SHAKE PANEL

Amos G. Winter, IV, Pinnacle Springs Rd., Spofford, N.H. 03462

Filed Sep. 18, 1989, Ser. No. 408,286
Int. Cl.[5] E04D *1/28*; E04B *1/70*
U.S. Cl. 52—303 **6 Claims**



1. A shingle comprising: a tip end; a butt end at an end opposite from said tip end; a strapping member having an inner surface, an outer surface opposite said inner surface and a lower facing surface, said strapping member attached to an underside of said shingle with said inner surface and said underside in contact and said lower facing surface parallel to said tip end and substantially perpendicular to said underside and positioned from said tip end toward said butt end by a distance amount substantially equal to a shingle exposure width and said strapping member having a length about equal to the shingle width, a depth of at least about ¼ inch, and a height less than said shingle exposure width and wherein said strapping member has at least one slot through said outer surface directed along said height dimension, substantially perpendicular to said lower facing surface and having a depth less than said strapping depth.

4,982,542

DEVICE FOR INCORPORATING LAYER MEMBER IN FACE CONSTRUCTION OF BUILDING

Motokatsu Funaki, 430 Shimo Tsuchidana, Fujisawa-shi, Kanagawa-ken, Japan

Filed Oct. 27, 1983, Ser. No. 546,007
Claims priority, application Japan, Dec. 22, 1982, 57-193070[U]; Jan. 13, 1983, 58-2904; Mar. 23, 1983, 58-40767[U]
Int. Cl.[5] E04B *1/62*
U.S. Cl. 52—401 **15 Claims**

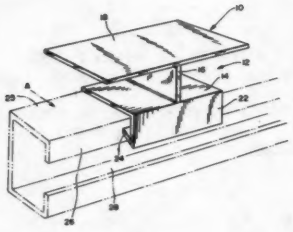
1. A device for incroporating a layer member in a face consturction of a building comprising:

a holding member comprising a fixing element adapted to be held on a supporting member of a building, a connecting element mounted on said fixing element and a holding element supported on said fixing element by said connecting element;

said connecting element being interposed between said fixing element and said holding element to define a space

therebetween which is surfficient to allow a first layer member to be received therein;

said holding element being formed of a palte in a substantially omega (Ω) cross-sectional shape so as to have a flat top surface portion, a pair of expended portions extending from said top portion, a pair of first constricted portions each one of said first constricted portions being connected to one said expanded portion, a pair of lower flange portions, each one of said lower flange portions being connected to one said first constricted portion, and a pair of upwardly bent portions, each one of said upwardly bent portions being connected to one said flange portion, said



first constricted portions, said flange portions and said upwardly bent portions defining recesses in said holding element;

a mounting member mounted on said holding member to hold a face member and at least one second layer member;

said mounting member being formed in a substantially convex shape having a pair of outward flanges formed at both sides of a lower end thereof and a pair of second constricted portion formed between said outward flanges and said lower end, said second constricted portions and outward flanges of said mounting member fixedly engaging said first constricted portions of said holding element and being securely received in said recesses.

4,982,543

LAP JOINT ROOF ASSEMBLY

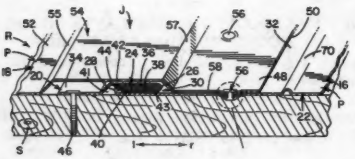
Thomas J. Boyd, Wellsburg, W. Va., assignor to The Louis Berkman Company, Follansbee, W. Va.

Continuation of Ser. No. 386,209, Jul. 28, 1989, Pat. No. 4,934,120. This application Jan. 2, 1990, Ser. No. 459,952

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] E04D *1/00*

U.S. Cl. 52—521 **10 Claims**



1. A metal, sealed roofing assembly comprising:

a cleat fixed to the roof substrate and having a hook end;

a first elongated roofing panel having a hook end, said first panel's hook end hooked to said cleat's hook end to define a lap joint;

a second elongated roofing panel overlying said cleat and said first panel's hook end; and

means for sealingly securing said first panel to said second panel at a position spaced away from said joint whereby said panels can thermally distort without adversely affecting the sealing of said roofing assembly.

4,982,544

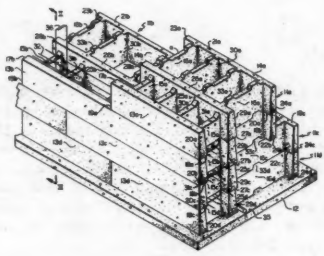
MODULE AND METHOD FOR CONSTRUCTING SEALING LOAD-BEARING RETAINING WALL

Peter J. Smith, Gansevoort, N.Y., assignor to Pomico International, Inc., New York, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,519

Int. Cl.[5] E04C *2/04*

U.S. Cl. 52—606 **8 Claims**



1. A precast concrete module for use in constructing sealing retaining walls capable of sustaining large vertical loads, the module comprising:

a front wall having a front face, a rear face, a top, a bottom, and two ends;

a partition wall spaced from the rear face of the front wall, the partition wall having a front face, a rear face, a top, a bottom, and two ends;

first and second spaced apart front connecting walls extending from the rear face of the front wall to the front face of the partition wall;

at least one rear connecting wall connected to and extending from the rear face of the partition wall, each rear connecting wall having a top and a bottom; and

stabilizing means spaced from the rear face of the partition wall and extending transversely from the at least one rear connecting wall, wherein

the area of each front connecting wall is less than the total area defined between the partition wall and the front wall and between the top and bottom of the front wall such that when at least two modules are arranged in at least one horizontal row, a clear space is provided for horizontal reinforcing bars extending the length of each row of modules between the front wall and the partition wall, and wherein

the locations of the top and bottom of each rear connecting wall are such that when two modules are arranged one on top of the other with a rear connecting wall of one module in vertical alignment with a rear connecting wall of the other module, the bottom of the rear connecting wall of the one module rests on the top of the rear connecting wall of the other module.

4,982,545

ECONOMICAL STEEL ROOF TRUSS

Gustav M. Stromback, 18700 Farm to Market Rd. 1431, Jonestown, Tex. 78675

Filed Jul. 10, 1989, Ser. No. 378,280

Int. Cl.[5] E04B *7/02*; E04C *3/11*

U.S. Cl. 52—639 **2 Claims**

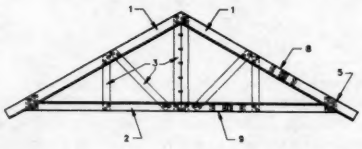
1. An economical steel roof truss for spanning large areas comprising:

(1) two top chord units with a cross sectional top hat shape with rolled flanges on the outer edge on each leg of said

cross sectional top hat shape and reinforcing ridges in said legs and base of said top hat shape and with the length of said legs of said top hat shape a minimum of twice the width of said base of said top hat shape; said top chord units being joined to each other at a first end, together with a top end of two C shaped web members to form an apex of a triangular shape with said two C shaped web members being fastened to each other back to back to form a king post;

(2) a lower chord unit connected with said top chord units and said king post and formed by splicing a minimum of two lower chord members with a cross sectional U shape with a portion of legs of said U shape rolled back to form a double thickness reinforcing edge and, with legs of said U shape being a minimum of twice as long as a base of said U shape and reinforcing ridges rolled in said legs and said base of said U shape;

(3) a rolled-to-fit lower chord member splicing means rigidly fastened with self tapping screws to butted-together first



ends of lower chord members to form said lower chord unit; said lower chord unit being fastened at a central point to a bottom end of said two C shaped web members with said bottom end fastened within said legs of said U shaped cross section of said lower chord unit with self tapping screws.

(4) a heel reinforcing segment, cut from a section of one of said C shaped web members, fastened in a vertical position inside a load bearing end of said steel truss; said load bearing end being formed by fastening each end of said lower chord unit to a second end of said upper chord units with said heel reinforcing segment being in a vertical position inside said each end of said lower chord unit,

(5) bracing members between said top chord units and said bottom chord units comprising said C shaped web members fastened at a top end inside said top chord unit and at a bottom end inside said bottom chord unit in a triangular pattern with self tapping metal screws to complete said steel roof truss for spanning large areas.

4,982,546

SPACE FRAME NODE

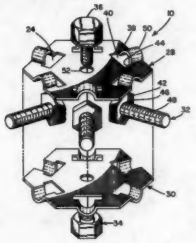
Fredric A. Lange, Osseo, Minn., assignor to Interlock Structures International, Inc., Maple Grove, Minn.

Filed Nov. 1, 1988, Ser. No. 265,713
Int. Cl.[5] E04H *12/00*
U.S. Cl. 52—648 **14 Claims**

1. A space frame node having a facet, comprising:

a hub including a pair of hub forming members facing one another to form mirror images of one another and means for fastening said hub forming members together, said hub including a receptor cavity, said hub including a plurality of pairs of hub forming members, each of said pairs being centered on a different axis, said axes being non-parallel;

means for creating said facet; and



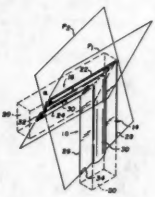
a transition connector connecting said hub and said facet creating means, said transition connector being received in said receptor cavity.

4,982,547

CORNER CONNECTOR FOR HOLLOW EXTRUSIONS

Klaus Stolle, Coquitlam, and Gerd Schoeffel, Maple Ridge, both of Canada, assignors to Stollco Industries Ltd., Port Coquitlam, Canada

Filed Mar. 29, 1989, Ser. No. 331,654
Int. Cl.[5] E04C *2/38*
U.S. Cl. 52—656 **9 Claims**



1. A corner assembly, comprising:

first and second elongate members extending at a predetermined angle to one another, said elongate members each having defined therein a hollow interior of a rectangular cross-sectional shape having diagonally opposite corners and front and rear faces; and

a corner connector having a pair of arms extending from one another at said predetermined angle,

wherein each of said arms has a pair of longitudinal edge portions snugly engaged in the diagonally opposite corners of said interior of a respective one of said first and second elongate members, and

wherein said arms are inclined relative to one another in respective transverse directions thereof, such that said elongate members have mutually aligned front and rear faces co-planar.

4,982,548

BEAM HANGER FOR PRECAST FOUNDATIONS

Jay E. Abbey, 416 Port Rd., Binghamton, N.Y. 13901

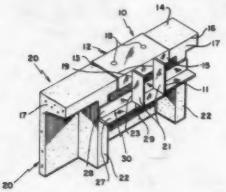
Filed Aug. 17, 1989, Ser. No. 394,912
Int. Cl.[5] E04B *1/381*
U.S. Cl. 52—702 **23 Claims**

1. A beam hanger for use in combination with a foundation wall of a building or home having at least two spaced apart internal support members, comprising:

a cradle for receiving and supporting a beam type member;

securing means attached to said cradle securing said cradle to a sill or lateral portion of a foundation wall; and

bracing means disposed adjacent said cradle and said securing means and extending laterally across and abutting at



least two of the internal support members of said foundation wall for providing bracing support for said cradle with respect to said two internal support members of said foundation wall, whereby a beam type member supported in said cradle will be braced against bending and twisting forces by said internal support members.

4,982,549

METHOD FOR END TO END COUPLING PREFABRICATED ELEMENTS OF REINFORCED CONCRETE

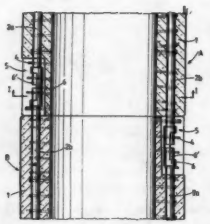
René-André Beck, Pully, Switzerland, assignor to BSA Ingenieurs Conseils, Pully, Switzerland

Filed Aug. 31, 1989, Ser. No. 401,639

Claims priority, application Switzerland, Oct. 7, 1988, 3740/88

Int. Cl.[5] E04C *3/30*

U.S. Cl. 52—726 **3 Claims**



1. Method for end to end coupling prefabricated elements of reinforced concrete, each element (A, B) comprising at at least one of its ends cavities (5) in its periphery, these cavities being opened on an outer lateral face as well as on an end face of said element, longitudinal metallic rods (2*a*) of the reinforcement emerging into said cavities, said rods having free ends that terminate short of said end face, other rods (2*b*) of the reinforcement which are located between said cavities projecting beyond said end face of the element, the method comprising placing the elements in alignment with their respective ends containing the cavities against each other, the relative angular position of said elements being such that the reinforcement metallic rods (2*b*) projecting beyond the end of one of the elements are introduced into the cavities (5) of another adjacent element, and vice versa, introducing the ends of the rods into positioning sleeves (6) having an opening (6') usable for welding, then welding together the metallic rods thus put end to end, and filling said cavities with a filling and finishing material.

4,982,550

JOINING OF A CONCRETE ELEMENT TO A SUPPORT

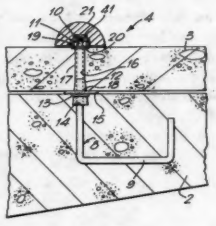
Henri Vidal, 8 bis, Boulevard Maillot, 92200 Neuilly-sur-Seine, France, and Santiago Muelas-Medrano, Madrid, Spain, assignors to Henri Vidal, Neuilly-sur-Seine, France

Filed May 12, 1989, Ser. No. 350,906

Claims priority, application United Kingdom, May 13, 1988, 8811377

Int. Cl.[5] E04B *1/38*

U.S. Cl. 52—747 **7 Claims**



1. A method of joining a concrete element to a support, comprising forming the concrete element with a hole through which a bolt projecting from the support passes, mounting fixing means on the bolt to secure the concrete element to the support with a spacer being located therebetween, wherein a resilient annular plug is located in the hole at its end facing the support and surrounds the bolt to form a first substantially watertight seal, and wherein the end of the hole remote from the support is provided with a second substantially watertight seal.

4,982,551

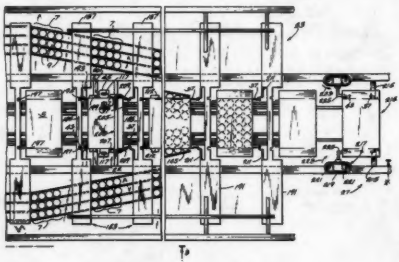
UNIVERSAL PACKER

Biagio J. Nigrelli, Sr., Kiel, Wis., assignor to Nigrelli System, Inc., Kiel, Wis.

Filed Jan. 17, 1989, Ser. No. 297,253

Int. Cl.[5] B65B *35/44, 35/54, 43/32*

U.S. Cl. 53—55 **27 Claims**



1. A universal packer comprising:

a. an elongated frame;

b. conveyor means for propelling open side container blanks in a downstream direction along the frame in an unfolding path, the blanks being supported by the frame and having foldable flaps, the blanks having leading and trailing edges;

c. metering means for controlling the supply of folded container blanks to the conveyor means, wherein the metering means comprises:

i. a hopper for holding a vertical stack of blanks;

ii. lip means for supporting a first quantity of blanks in the hopper above the conveyor means;

iii. ledge means for selectively holding a second quantity of blanks above and out of contact with the first quantity of blanks and releasing the second quantity of blanks to fall onto the first quantity of blanks on the lip means; and

iv. gripping means for selectively holding a third quantity of blanks above and out of contact with the second quantity of blanks and releasing the third quantity of blanks to fall onto and be supported by the ledge means;

d. unfolding means for cooperating with the conveyor means to unfold the blanks into open side containers;

e. infeed means for feeding quantities of articles along at least one path in the downstream direction adjacent to the conveyor means;

f. grouper means for forming complements of a desired number of articles and for propelling the complements in the downstream direction in unison and alignment with and in transverse alignment with respective open containers;

g. pusher bar means for propelling the complements of articles downstream in unison and alignment with the open containers subsequent to the propulsion thereof by the grouper means;

h. flap control means downstream of the unfolding means for positively restraining al the flaps of the open containers in respective controlled locations; and

i. means for loading the complements into respective open containers,

so that the ledge means and gripper means cooperate to control the quantity of blanks supported by the lip means.

4,982,552

APPARATUS FOR THE PACKAGING OF PAPER STACKS

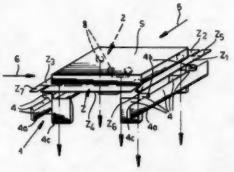
Heinz F. Odenthal, Zülpich, Fed. Rep. of Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 479,064

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908184

Int. Cl.[5] B65B *11/04*

U.S. Cl. 53—207 **9 Claims**



1. An apparatus for the packaging of a paper stack, comprising:

a box-folding assembly having a plurality of guide rods crossing orthogonally at corners of the box-folding assembly, and box-folding elements carried on at least some of said guide rods for folding a box blank drawn through said box-folding assembly into a box for receiving a stack of paper;

adjustment means connected with said guide rods of said box-folding assembly for shifting at least some of said guide rods of said box-folding assembly relative to others of said guide rods of said box-folding assembly to set a format of a box to be formed and a paper stack to be received therein;

a suction-plunger assembly having a plurality of guide rods extending parallel to said guide rods of said box-folding assembly, a plurality of suction plungers mounted on the guide rods of said suction-plunger assembly and adjustable therewith for different formats of boxes and stacks to be packaged, and means for raising said suction plungers to form a receiving plane for a box blank above said elements and lowering said suction plungers to lower said box blank and a paper stack disposed thereon past said elements, whereby said elements fold said box blank into a box around said stack disposed on said box blank; and

means mechanically connecting said guide rods of said suction-plunger assembly with guide rods of said box-folding assembly for adjustment of the positions of said plungers simultaneously with adjustment of said guide rods of said box-folding assembly to a respective format of boxes and stacks to be packaged.

4,982,553

AUTOMATIC TEST TUBE PLUG EXTRACTION APPARATUS

Teruaki Itoh, 5-25, Kokaihonmachi, Kumamoto-shi, Kumamoto-Ken 860, Japan

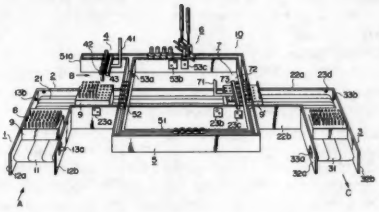
PCT No. PCT/JP87/00199, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/06709, PCT Pub. Date Nov. 5, 1987

PCT Filed Mar. 31, 1987, Ser. No. 137,855

Claims priority, application Japan, Apr. 30, 1986, 61-66703; Apr. 30, 1986, 61-66705; Aug. 27, 1986, 61-131705

Int. Cl.[5] B65B *35/36, 43/40*

U.S. Cl. 53—246 **4 Claims**



1. An automatic test tube plug extraction apparatus comprising: a rack-inlet mechanism for transporting a rack into a main housing, said rack having a plurality of test tubes arranged in m columns and n rows; a rack-transporting mechanism for transporting the rack along a path provided in said main housing; a tube-extracting mechanism for extracting the test tubes from said rack, row by row, while said rack is being transported by said rack-transporting mechanism; a tube-conveying mechanism for conveying the test tubes, one by one, in a predetermined order after the test tubes have been extracted, row by row, by said tube-extracting mechanism, said tube-conveying mechanism comprising a tube-conveying path having guide edges and is designed to convey cylindrical tube holders each having an annular groove in which said guide edges are inserted; a plug-extracting mechanism for pulling each test tube conveyed by said tube-conveying mechanism and the plug closing this test tube, away from each other, while holding the test tube and the plug, thereby to extract the plug from the test tube; a tube-inserting mechanism for inserting the tubes, row by row, into a vacant rack transported by said rack-transporting mechanism, said test tubes having been further conveyed by said tube-conveying mechanism after the plugs have been extracted from them; and a rack-outlet mechanism for transporting said rack from said main housing after a predetermined number of rows of test tubes have been inserted into this rack.

4,982,554

APPARATUS FOR APPLYING CLOSURES TO CONTAINERS

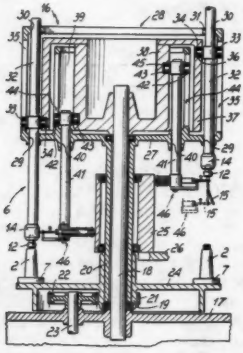
Carlo Corniani, Marmirolo, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed Oct. 18, 1989, Ser. No. 423,287

Claims priority, application Italy, Oct. 31, 1988, 3645 A/88

Int. Cl.[5] **B65B** *7/28;* **B67B** *3/20*

U.S. Cl. 53—290 **9 Claims**



1. An apparatus for applying closures to containers, the closures being of the type having a protruding tube being insertable into a respective container, the apparatus comprising

support structure means defining an axis of rotation,

rotating conveyor closure unit means, and

drive means,

said rotating conveyor closure unit means being rotatably supported by said support structure means and being driven about said axis of rotation by said drive means, said rotating conveyor closure unit means comprising

container conveyor support means for receiving in succession and supporting thereon containers to be closed,

closure grip means adapted for receiving in succession and gripping therein closures to be applied to containers,

tube grip means adapted for slidably gripping and straightening protruding tubes of closures gripped by said closure grip means,

first slidable shaft means being linearly slidable in a direction substantially parallel to said axis of rotation,

first roller means,

second slidable shaft means being linearly slidable in a direction substantially parallel to said axis of rotation,

second roller means, and

box-like body support means for slidably supporting said first slidable shaft means by means of said first roller means and for slidably supporting said second slidable shaft means by means of said second roller means,

said closure grip means being rigidly associated with a free end of said first shaft means, said tube grip means being rigidly associated with a free end of said second shaft means, said container conveyor support means being mutually structurally arranged with said closure grip means and said tube grip means such that container supported by said container conveyor support means are interposed between said container conveyor support means and said tube grip means and said closure grip means, said apparatus further comprising

first actuation cam means,

second actuation cam means, and

third actuation cam means,

said third actuation cam means being stationary actuation cam means and being arranged laterally to said tube grip means associated with said second shaft means, said tube grip means comprising

cam follower actuation means for actuating said tube grip means by means of said third actuation cam means,

whereby when said rotating conveyor closure unit means rotates about said axis of rotation of said support structure means, said first roller means of said first slidable shaft means engages with said first actuation cam means to thereby linearly slide said first slidable shaft means parallel to said axis of rotation, said second roller means of said second slidable shaft means engages with said second actuation cam means to thereby linearly slide said second slidable shaft means parallel to said axis of rotation, and said cam follower actuation means engages with said third actuation cam means to thereby actuate said tube grip means to actively slidably grip and straighten protruding tubes of closures, said first actuation cam means, said second actuation cam means and said third actuation cam means being mutually functionally arranged so as to cause a correct successive insertion of protruding tubes of closures into containers.

4,982,555

METHOD AND APPARATUS FOR THE CLOSING OF A CONTAINER

Ole Ingemann, deceased, late of Svendborg, Denmark (by Ingrid Therkelsen, legal representative), assignor to PLM AB, Djaknegatan, Sweden

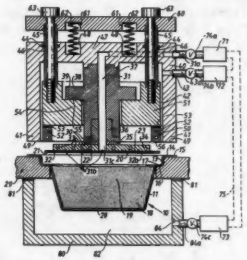
PCT No. PCT/SE88/00538, § 371 Date Aug. 7, 1989, § 102(e) Date Aug. 7, 1989, PCT Pub. No. WO89/03344, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 14, 1988, Ser. No. 378,196

Claims priority, application Sweden, Oct. 15, 1987, 8704048

Int. Cl.[5] **B65B** *7/28, 31/02;* **C14B** *1/02*

U.S. Cl. 53—405 **19 Claims**



1. A method for vacuum sealing an open container comprising

engaging a sealing wafer in a central region thereof to leave an annular peripheral region of the wafer free,

providing relative movement between said sealing wafer and said open container to contact the free annular peripheral region of the sealing wafer with an annular portion of said container surrounding an opening in the container so that the sealing wafer covers said opening,

forming a space adjacent to the container and extending around said annular portion, and

said space being formed by displacing an outer sealing means into contact with the container in a region thereof outside the region where the wafer contacts the container,

reducing the pressure in said space and in said container, via said free annular peripheral region of the wafer, before the sealing joint is formed, and

forming a fluid-tight sealing joint between the annular peripheral region of the sealing wafer and in annular portion of the container to seal said opening of the container by said wafer.

4,982,556

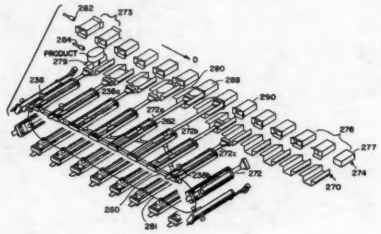
MODULARLY CONSTRUCTED AUTOMATIC PACKAGING MACHINE

Steven Tisma, Chicago, Ill., assignor to Tisma Machine Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 349,224, May 9, 1989, which is a continuation-in-part of Ser. No. 164,010, Mar. 4, 1988, Pat. No. 4,856,566. This application Nov. 3, 1989, Ser. No. 431,378

Int. Cl.[5] B65B *57/06, 57/14, 5/06, 39/14*

U.S. Cl. 53—506 **23 Claims**



22. An automatic packaging machine comprising a plurality of conveyors for transporting items around closed paths, said closed paths coinciding in areas where items are transferred from one closed path to another closed path, transfer rods for accomplishing said transfer, a cam pin associated with each of said transfer rods, each of said cam pins having two stable positions, means associated with said closed paths for guiding and directing said cam pin to move into either of said two positions and means responsive to said cam pin moved into only one of said two positions for moving said transfer rod in order to transfer said item to said other closed path.

4,982,557

DEVICE FOR SMOOTHING OUT AND PRESSING TOGETHER THE FREE PROJECTING END EXTENDING OVER THE FILLING MATERIAL OF FILLED SACKS

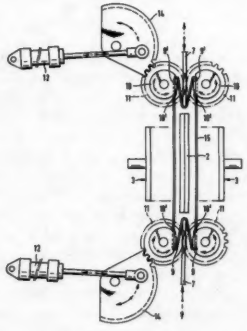
Adolf Gradwohl, Gleisdorf, Austria, assignor to Binder & Co. Aktiengesellschaft, Gleisdorf, Austria

Filed Oct. 18, 1989, Ser. No. 423,009

Claims priority, application Austria, Nov. 25, 1988, 2902/88

Int. Cl.[5] B65B *7/02*

U.S. Cl. 53—371 **7 Claims**



1. A device for smoothing out and pressing together a free end of a sack having an opening extending in a plane and an axis extending perpendicularly to said plane, the sack containing a filling material and the free end comprising side walls folded inwardly towards the axis and projecting beyond the filling material, which device comprises

(a) two pairs of fingers movable in planes extending in, or parallel to, the plane of the sack opening and perpendicularly to the plane of the sack opening, the fingers extending in the direction of the axis for engaging the sack opening, the fingers of each pair being spaced from each other in a direction extending transversely to the axis,

(b) two rods or knives movable towards each other from outside the sack and displaceable between the fingers of each pair engaging the sack opening, and

(c) two disks corresponding to each pair of fingers, said two disks rotatable in opposite directions about axes of rotation extending substantially parallel to the axis of the sack, the fingers of each pair being eccentrically arranged on a respective one of the rotatable disks.

4,982,558

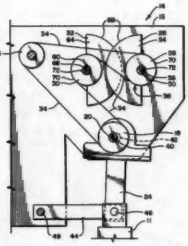
COUNTERWEIGHT METHOD AND SYSTEM FOR A BEATER ROD OF A HARVESTER

Scott A. Korthuis, Lynden, Wash., assignor to Korvan Industries, Lynden, Wash.

Filed Sep. 29, 1989, Ser. No. 414,908

Int. Cl.[5] A01D *46/26*

U.S. Cl. 56—12.6 **13 Claims**



1. A drive system to move a moveable beater assembly means of a harvesting machine in a back and forth movement, said drive system comprising:

a. a housing structure;

b. a drive means driveably connected with said beater assembly means and adapted to drive said beater assembly means in said back and forth movement in a manner that said movement exerts on said housing structure a beater assembly force directed along an alignment axis;

c. a drive compensating means comprising:

i. a first eccentrically revolving weight means mounted to said housing structure for rotation;

ii. a second eccentrically revolving weight means mounted to said housing structure for rotation;

iii. a drive transmission to rotate said first and second weight means in a manner to exert on said housing structure a net compensating force that is colinear with said alignment axis so that said net compensating force, in a timed relationship with said back and forth movement of said beater assembly means opposes colinearly said beater assembly force whereby an equilibrium of said housing structure is able to be maintained.

4,982,559

NUT HARVESTER

Anthony J. Calais, 107 Denier, Lafayette, La. 70508

Filed Sep. 22, 1989, Ser. No. 411,912

Int. Cl.[5] A01D *51/00*

U.S. Cl. 56—328.1 **20 Claims**

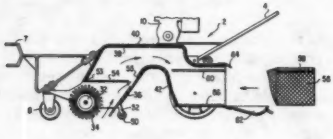
1. A nut harvester comprising:

wheeled body means for guiding in a path;

sweeper means attached to the body means for collecting nuts;

flexible elongated means on the sweeper means for picking up nuts;

passage means in the body means for allowing nuts to pass through into said body means;



barrier means attached to said body means extending substantially across said passage means for substantially barring passage of debris; and

means extending from the body means adjacent the sweeper means for deflecting nuts toward said passage means; and

means for receiving nuts attached to said body means.

4,982,560

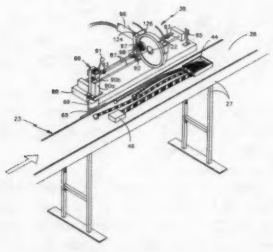
WIRE HARNESS TAPING ARRANGEMENT AND TAPING MACHINE THEREFOR

Jordi B. Vives, Valls, and Jaime U. Hernandez, Tarragona, both of Spain, assignors to Mecanismos Auxiliares Industriales, S.A., Valls, Spain

Filed Aug. 17, 1989, Ser. No. 395,373

Int. Cl.[5] B65H *81/06*

U.S. Cl. 57—10 **16 Claims**



1. A taping arrangement for the mechanized wrapping of tape about an elongated bundle of wires undergoing fabrication into a wire harness and disposed on a conveyor, comprising, at a work station adjacent the conveyor:

a taping machine, including a housing, a drive motor connected to the housing, an orbiting mechanism supported by the housing and driven by the motor in an orbital path about a central region in which the wire bundle is disposed, and tape dispensing means mounted on the orbiting mechanism for dispensing tape to the wire bundle as the mechanism orbits about the wire bundle;

mounting means for the taping machine to facilitate manual displacement of the machine longitudinally of the wire bundle to be taped, said taping machine mounting means including a support platform positioned adjacent to the conveyor and mounted for pivotable motion relatively toward and away from the conveyor between respective operating and idle positions; and

the mounting means and taping machine being positioned adjacent to the conveyor at least during taping of a wire bundle.

4,982,561

UPWARD TWISTING MACHINE, IN PARTICULAR DOUBLE TWISTING MACHINE

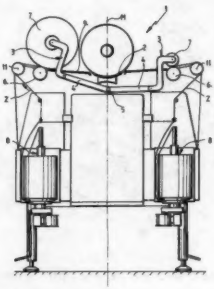
Günter Stranzke; Rolf D. Weber, and Erich Jenter, all of Kempten, Fed. Rep. of Germany, assignors to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

Filed Dec. 20, 1989, Ser. No. 453,981

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1988, 3842783

Int. Cl.[5] D01H *1/10, 7/08*

U.S. Cl. 57—62 **7 Claims**



1. In an upward double twisting machine for transferring elongate ropelike members from twisting stations to respective take-up bobbins, including a carrying arm for each twisting station, means for defining a pivot axis at one end of said carrying arm, said pivot axis being arranged adjacent a vertical longitudinal center plane of said twisting machine and extending parallel thereto, said carrying arm being pivotable about said pivot axis through a range of pivotal movement, a creel for carrying said take-up bobbin being connected to another end of said carrying arm, said creel including means for supporting said take-up bobbin for rotation about a bobbin axis, a take-up cylinder for each twisting station, means for supporting said take-up cylinder for rotation about a rotational axis adjacent said bobbin, an endless conveyor belt which intersects and extends parallel to said vertical longitudinal center plane, said rotational axis of said take-up cylinder being located above a horizontal conveying plane defined by said endless conveyor belt, and a cover plate inclining downwardly from said take-up cylinder toward said endless conveyor belt for transferring full bobbins from said creel onto said endless conveyor belt, the improvement comprising:

said endless conveyor belt overlying said pivot axis of said carrying arm, a pneumatic cylinder for effecting pivotal movement of said carrying arm, means for stationarily supporting one end of said pneumatic cylinder, another end of said pneumatic cylinder being connected to said carrying arm, said creel including a pair of creel arms connected to said another end of said carrying arm and forming an angle in the range of 90° to 130° with said carrying arm, said cover plate having a slot therein for permitting passage of each said creel arm therethrough, said carrying arm being positioned below said cover plate and remaining below said cover plate throughout said range of pivotal movement thereof, and said bobbin axis and said rotational axis of said take-up cylinder being parallel to and respectively spaced from said pivot axis such that a line of tangential contact between said take-up cylinder and a bobbin winding on said bobbin is always located between said vertical longitudinal center plane and another vertical plane passing through said rotational axis of said take-up cylinder.

4,982,562

SPINNING AND TWISTING DEVICE

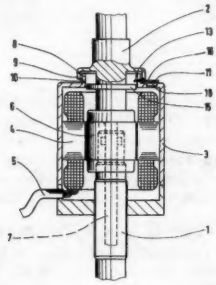
Klaus Mette, Remseck, and Helmut Speiser, Weinstadt, both of Fed. Rep. of Germany, assignors to SKF Textilmaschinen-Komponenten GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1989, Ser. No. 446,388

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841506

Int. Cl.[5] D01H *7/14, 1/244*

U.S. Cl. 57—132 6 Claims



1. A spinning or twisting machine comprising a spindle bearing housing and spindle blade a surrounding casing provided with a neck through which the spindle blade axially passes for housing said spindle bearing and spindle blade, a collar integrally formed on said spindle below said neck, an annular groove formed in the exterior surface of said neck and having a hole extending radially therethrough, and a fork-shaped latch resiliently slideable in said groove having a projection extending inwardly through the hole in said groove to lie in opposition to the collar on said spindle blade to thereby prevent axial movement of the spindle blade through said neck.

4,982,563

SLIVER CONNECTING ARRANGEMENT FOR A SPINNING MACHINE

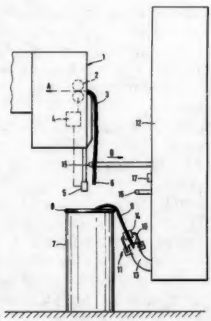
Fritz Stahlecker, Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Filed Jan. 27, 1989, Ser. No. 302,328

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802414

Int. Cl.[5] D01H *4/48, 15/013*

U.S. Cl. 57—261 13 Claims



1. A spinning machine comprising

a plurality of adjacently arranged spinning units, each unit containing a sliver feeding means for the withdrawal of a sliver from a container and for the introduction of the sliver into the respective spinning unit,

sliver splicing means including new sliver pick-up means for picking up the starting portion of a now sliver of a readied container,

sliver connecting means for connecting the starting portion with the old sliver entering into the respective spinning unit, and

sliver stopping means for stopping the sliver feeding means in order to leave an end portion of the old sliver which remains outside the spinning unit to be connected with the starting portion of the new sliver,

wherein the new sliver pick-up means is carried by a mobile servicing apparatus which can be selectively moved to respective spinning units to facilitate to sliver splicing operation, said mobile servicing apparatus including old sliver support means for supporting the end portion of the old sliver and new sliver support means for supporting the starting portion of the new sliver, said old sliver support means and new sliver support means being relatively movable with respect to each other and operable to support the end portions of the old and new sliver in overlapping relation with one another.

4,982,564

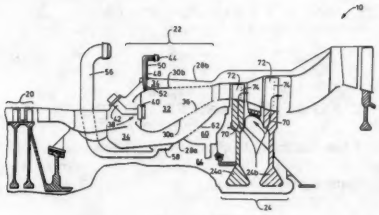
TURBINE ENGINE WITH AIR AND STEAM COOLING

William R. Hines, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 14, 1988, Ser. No. 284,507

Int. Cl.[5] F02C *3/30, 7/16*

U.S. Cl. 60—39.55 16 Claims



1. A turbine engine, comprising:

a compressor for introducing compressed air into said engine;

a combustor downstream from said compressor, said combustor comprising a casing, and a liner dispersed within and spaced apart from said casing such as to form a mixing region between the liner and the casing, wherein said liner forms a combustor inlet at the upstream end of said combustor and said mixing region receives at least a portion of said compressed air, and said liner is formed such as to allow flow between the mixing region and the combustion zone;

a turbine downstream from said combustor, said turbine having a cooling passage therein;

means for introducing steam into said mixing region downstream of said combustor inlet such as to form an air and stream mixture; and

means for introducing said air and stream mixture into said cooling passage.

4,982,565

PILOT BURNER FOR A DEVICE FOR BURNING SOLIDS IN THE EXHAUST GAS OF INTERNAL COMBUSTION ENGINES

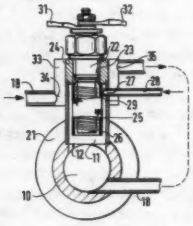
Ulrich Projahn, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch-GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 458,144

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903065

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—303 **4 Claims**



1. Pilot burner for a combustion device for burning solid particles in the exhaust gas of internal combustion engines, comprising

a hollow cylindrical mixing chamber having a closed end and an opposed open end leading to the combustion device,

a hollow cylindrical glow plug chamber connected to the mixing chamber transversely thereof,

a glow plug comprising a spiral incandescent element coaxially disposed in said glow plug chamber,

a thin-walled protective tube of fine meshed wire fabric coaxially enclosing the incandescent element radially spaced therefrom,

a fuel supply pipe ending in the glow plug chamber in the proximity of said protective tube, and

an air supply pipe ending in the mixing chamber.

4,982,566

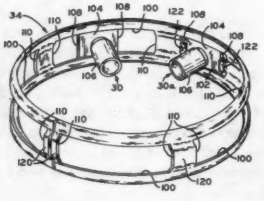
EXPANDER BAND FOR HYDROSTATIC TRANSMISSION

Roland von Kaler, 9402 Pleasant Dr., Tecumseh, Mich. 49286, and Christian H. Thoma, Chalet Abaco, Green Road, St. Clement, Jersey, Great Britain

Filed Feb. 22, 1990, Ser. No. 482,974

Int. Cl.[5] F01B *13/06;* **F04B** *19/02*

U.S. Cl. 60—487 **12 Claims**



1. A hydraulic pump or motor comprising:

a cylinder unit comprising a plurality of radial cylinders and a plurality of pistons, each said piston positioned within one of said cylinders, each said piston attached to an associated slipper;

a track ring positioned about said cylinder unit and engaging said slippers; and

an expander band means disposed around said cylinder unit for urging said slippers against said track ring, said expander band including a fixed holding means for holding one of said slippers in a fixed position relative to said expander band, and said expander band further including a plurality of variable holding means disposed circumferentially around said expander band for allowing circumferential movement of said other slippers relative to said expander band so that as said cylinder unit rotates said other slippers have a limited range of movement relative to said expander band.

4,982,567

AIR SUPPLY CONTROL SYSTEMS FOR TURBOCHARGED INTERNAL COMBUSTION ENGINES

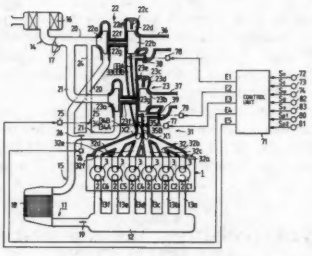
Takayoshi Hashimoto; Masanori Shibata; Haruo Okimoto; Seiji Tashima; Kaoru Yamada; Toshimichi Akagi; Ritsuharu Shimizu; Masaru Yamamoto, and Masashi Ohmori, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 24, 1989, Ser. No. 300,927

Claims priority, application Japan, Jan. 29, 1988, 63/019084; Jan. 31, 1988, 63/020968; Jan. 31, 1988, 63/020969; Jul. 30, 1988, 63/191652

Int. Cl.[5] F02B *37/12*

U.S. Cl. 60—600 **15 Claims**



1. An air supply control system for an internal combustion engine comprising:

engine exhaust passages;

engine intake passages;

at least first and second turbosuperchargers each composed of a turbine disposed in one of exhaust passages of the engine and a blower connected through a shaft with the turbine and disposed in one of intake passages of the engine,

an exhaust cutoff valve operative selectively to be open and closed respectively for opening and closing the exhaust passage in which the turbine of said second turbosupercharger is disposed,

an intake air cutoff valve operative selectively to be open and closed respectively for opening and closing the intake passages in which the blower of said second turbosupercharger is disposed,

cutoff valve control means operative to cause both said exhaust cutoff valve and said intake air cutoff valve to be closed when intake air mass flow fed to the engine is detected to be within a first operating area in which the intake air mass flow is relatively small and to cause both said exhaust cutoff valve and said intake air cutoff valve to be open when intake air mass flow fed to the engine is detected to be in a second operating area in which the intake air mass flow is relatively large, so that said first turbosupercharger works for supercharging the engine

when the intake air mass flow fed to the engine is relatively small and both of said first and second turbosuperchargers work simultaneously for supercharging the engine when the intake air mass flow fed to the engine is relatively large,

memory means for storing said first and second operating areas,

engine operation detecting means for detecting an operating condition of the engine, and

operation control means for varying said first and second operating areas so that a boundary between said first and second operating areas can be varied in response to the operating condition detected by said engine operation detecting means.

4,982,568

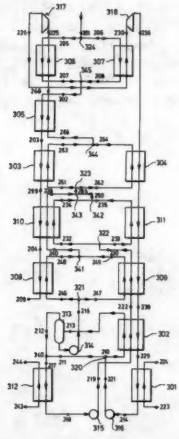
METHOD AND APPARATUS FOR CONVERTING HEAT FROM GEOTHERMAL FLUID TO ELECTRIC POWER

Alexander I. Kalina, 105 Glen Garry Way, Hillsborough, Calif. 94010

Continuation-in-part of Ser. No. 295,829, Jan. 11, 1989, abandoned. This application Mar. 22, 1989, Ser. No. 327,299

Int. Cl.[5] F01K *25/06*; F03G *7/00*

U.S. Cl. 60—649 **33 Claims**



1. A method for implementing a thermodynamic cycle comprising the steps of:

expanding a gaseous working stream, transforming its energy into usable form and producing a spent stream;

reheating and expanding the spent stream, to transform its energy into usable form;

heating a multicomponent oncoming liquid working stream by partially condensing the spent stream to preheat and partially evaporate the multicomponent oncoming liquid working stream to produce a heated liquid working stream; and

evaporating the heated liquid working stream using heat produced by an external heat source, to form the gaseous working stream.

4,982,569

PARALLEL HYBRID SYSTEM FOR GENERATING POWER

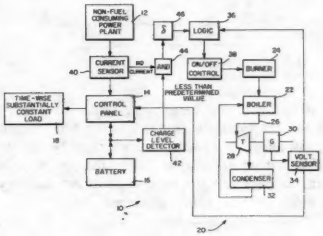
Lucien Y. Bronicki, Rehovot, Israel, assignor to Ormat Turbines, Ltd., Yavne, Israel

Continuation of Ser. No. 725,538, Apr. 22, 1985, abandoned, which is a continuation of Ser. No. 479,072, Mar. 25, 1983, Pat. No. 4,551,980. This application May 21, 1986, Ser. No. 865,589

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[5] F03G *7/02*

U.S. Cl. 60—698 **25 Claims**



1. A power plant for supplying electricity to an essentially constant electrical load comprising:

(a) a non-fuel consuming power source for intermittently generating power;

(b) a battery system for supplying power;

(c) an electrical power generator connected to a selectively operable fuel-consuming prime mover for generating power when said prime mover is started and operated;

(d) interconnection means for connecting said non-fuel consuming power source, said battery system, and said power generator to said load in parallel;

(e) battery condition sensor means for sensing when the charge level of the battery drops below a threshold;

(f) power source condition sensor means for sensing nighttime conditions; and

(g) logic means responsive to the condition sensors for automatically starting up and operating said prime mover only at night and when the charge level of the battery system is below a threshold.

4,982,570

PREMIXED PILOT NOZZLE FOR DRY LOW NOX COMBUSTOR

Jennifer Waslo, Scotia; Masayoshi Kuwata, Ballston Lake, and Roy M. Washam, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 934,885, Nov. 25, 1986, abandoned. This application Mar. 22, 1990, Ser. No. 501,439

Int. Cl.[5] F23R *3/34*

U.S. Cl. 60—733 **16 Claims**

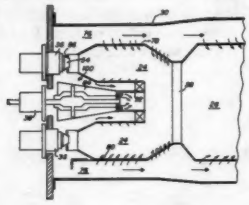
1. A combined diffusion and premix nozzle comprising:

a diffusion pilot comprising a first axial fuel delivery pipe having an inlet end and a discharge end; a second axial air delivery pipe coaxial with the first axial fuel delivery pipe and surrounding the first axial fuel delivery pipe; and, a first swirler annulus disposed at the discharge end of the first axial fuel delivery pipe between the first axial fuel delivery pipe and the surround second axial air delivery pipe;

the first axial fuel delivery pipe further including a plurality of radial fuel distribution tubes extending outwardly from the first axial fuel delivery pipe and located toward the inlet end of the first axial fuel delivery pipe, the radial fuel distribution tubes extending beyond the circumference of the second axial air delivery pipe; said second axial air

delivery pipe having an air inlet end upstream of said radial fuel distribution tubes;

a premix chamber surrounding the diffusion pilot and including an inlet end and a discharge end, the radial fuel distribution tubes extending into the premix chamber;



at least one fuel discharge hole in at least one radial fuel distribution tube, the fuel discharge hole directed toward the discharge end of the premix chamber; and,

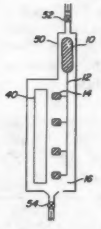
a second swirler annulus at the discharge end of the premix chamber between the second axial air delivery pipe and the surrounding premix chamber.

4,982,571

SAFETY APPARATUS FOR SUPERCONDUCTING MAGNETIC ENERGY STORED SYSTEM

David Marschik, Murrysville, and James R. Logan, Hampton Twp., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1989, Ser. No. 389,098
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.1 **18 Claims**



1. An automatic hydraulic activation mechanism (AHAM) for performing work in a superconducting magnetic energy storage (SMES) system employing a cryogenic coolant, the AHAM comprising;

(a) at least one hydraulic working fluid reservoir containing a working fluid in thermal contact with the cryogenic coolant;

(b) at least one hydraulic actuator disposed to perform work upon an increase in working fluid pressure; and

(c) communicating means for communicating the increase in working fluid pressure to said hydraulic actuator.

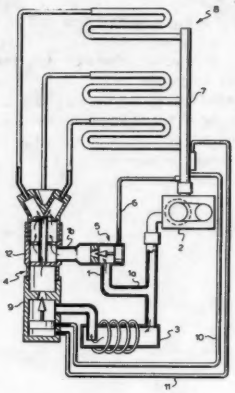
4,982,572

VAPOR INJECTION SYSTEM FOR REFRIGERATION UNITS

Robert A. Moore, Hamilton, Canada, assignor to 810296 Ontario Inc., Hamilton, Canada

Filed May 2, 1989, Ser. No. 346,498
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—122 **28 Claims**

1. A method for use in a gas/liquid mixing stage of a vapour compression cycle refrigeration system, comprising the steps of imparting a substantial helical motion to a first flow of fluid refrigerant in one thermodynamic state, and merging said first flow with a second flow of fluid refrigerant in another dissimi-



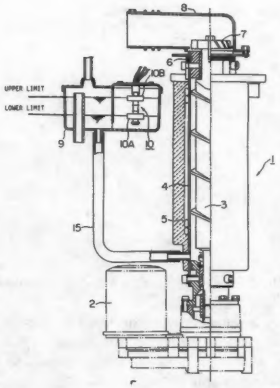
lar thermodynamic state, whereby the helical motion of the first flow results in substantial turbulent mixing of the first and second flows upon merging thereof, to produce a generally thermodynamically uniform admixture.

4,982,573

ELECTRIC CONTROL APPARATUS FOR AUGER TYPE ICE MAKING MACHINE

Susumu Tatematsu, Nagoya; Yasumitsu Tsukiyama, Toyoake, and Junichi Hida, Nagoya, all of Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

Filed Apr. 24, 1990, Ser. No. 514,065
Claims priority, application Japan, Apr. 25, 1989, 64-103411
Int. Cl.[5] F25C *1/14*
U.S. Cl. 62—135 **4 Claims**



1. An electric control apparatus for an auger type ice making machine having an auger mounted for rotary movement within an evaporator housing to which water is supplied from a water tank to cause ice crystals to form on the internal freezing surface of said evaporator housing, the electric control apparatus comprising:

a first water level detector disposed within said water tank to detect a level of water in said water tank for producing a first signal therefrom when the level of water has fallen to a lower limit level;

a second water level detector disposed within said water tank to detect the level of water in said water tank for producing a second signal therefrom when the level of water has risen up to an upper limit level;

a timer cooperable with said second water level detector for measuring a predetermined period of time in response to said second signal, the period of time being determined to correspond with a time interval defined by said first and second signals in normal operation of the ice making machine and adjusted taking into consideration a time for which operation of the ice making machine is made in a stable condition to form ice crystals on the internal freezing surface of said evaporator housing; and

means cooperable with said timer for rendering the ice making machine inoperative when the predetermined period of time has been measured by said timer before applied with said first signal.

4,982,574

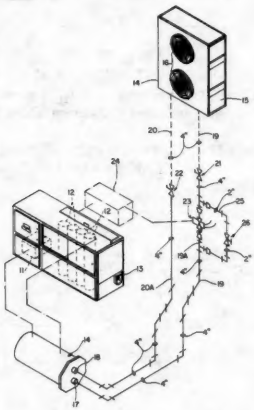
REVERSE CYCLE TYPE REFRIGERATION SYSTEM WITH WATER COOLED CONDENSER AND ECONOMIZER FEATURE

William F. Morris, Jr., P.O. Box 1046, Raleigh, N.C. 27602-1046

Filed Mar. 22, 1990, Ser. No. 497,303

Int. Cl.[5] F25C *5/10*

U.S. Cl. 62—155 **6 Claims**



1. In a reverse cycle type defrost ice maker refrigeration system having a compressor, a condenser evaporator means, water tower means and a cooling water conduit system for flow of cooling water from the water tower through a water supply leg to the condenser for heat exchange cooling of refrigerant in the condenser and return of the water through a return leg to the tower, a refrigerant conduit system for conducting refrigeration from the compressor through heat exchange coil means in the condenser to be cooled by cooling water from the water tower means and for conveying condensed liquid refrigerant from the condenser to the evaporator means and returning gaseous refrigerant from the evaporator to the compressor, refrigerant valve means for bypassing the condenser and routing hot gaseous refrigerant to the evaporator and system cycle control means therefor for cycling the system through an ice making cycle and through a harvest defrost cycle; the improvement comprising a main water supply control valve means in said water supply leg of said cooling water conduit system interposed in said supply leg between the water tower means and a cooling water inlet of said condenser connected to said supply leg and valve control means for actuating the main water supply control valve to shut off cooling water supply to the condenser cooling water inlet immediately at the commencement of each harvest defrost cycle to cause condensing pressure to increase quickly up to a predetermined trip-point pressure whereupon harvest pressure switch means of the system cycle control means responds to pressure rise at the condenser discharge at the trip-point pressure to activate the refrigerant valve means to route hot gaseous refrigerant to the evaporator means for the duration of the harvest defrost cycle.

4,982,575

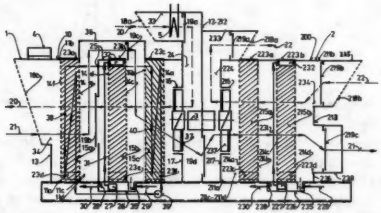
APPARATUS AND A METHOD FOR ULTRA HIGH ENERGY EFFICIENT DEHUMIDIFICATION AND COOLING OF AIR

Ferdinand K. Besik, 2562 Oshkin Court, Mississauga, Ontario, Canada (L5N 3Z3)

Continuation-in-part of Ser. No. 152,808, Feb. 5, 1988, Pat. No. 4,952,283, and Ser. No. 232,856, Aug. 16, 1988. This application Aug. 16, 1988, Ser. No. 232,854

Int. Cl.[5] F25B *17/00, 23/00;* **B01D** *53/04*

U.S. Cl. 62—271 **19 Claims**



1. Apparatus and a method for ultra high energy efficient dehumidification and cooling of air including:

matrix container means for retaining matrix means and having intake-exit means including damper means for intake and exit of primary and secondary air streams, and having flanged openings for replacement of said matrix means, said matrix container means operating in a cycle including a sorption and a desorption periods,

matrix means including first matrix, second matrix and third matrix, said first matrix including means for removing particulates and for absorbing and releasing sensible heat, said second matrix including means for adiabatic cooling of said primary and secondary air streams, and said third matrix including desiccant means for removing moisture from said primary air stream, with said primary air stream passing through said matrix means during said sorption period and first being sensibly cooled in said first matrix, then adiabatically cooled in said second matrix and then dehumidified in said third matrix and then discharged from said container means, and with said third matrix being reactivated by said first secondary air stream passing through said matrix means during said desorption period, with said first secondary air stream being adiabatically cooled in said third matrix and second matrix and then sensibly heated in said first matrix while cooling said first matrix during said desorption period,

air fan means for passing said primary and secondary air streams alternately and countercurrently to each other through said matrix container means during said sorption and desorption periods and

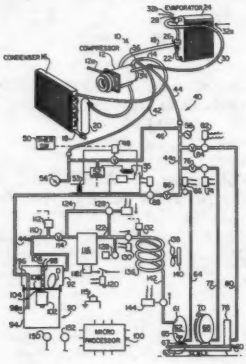
process control means for controlling said operating cycle and for maintaining a continuous operation of said apparatus.

4,982,576

AIR CONDITIONER CHARGING STATION WITH SAME REFRIGERANT RETURN AND METHOD

Robert H. Proctor, Rossville, and Dennis P. Eichenlaub, Kingstown, both of Md., assignors to Murray Corporation, Cockeysville, Md.

Filed Dec. 10, 1987, Ser. No. 131,623
Int. Cl.[5] F25B *45/00, 43/00*
U.S. Cl. 62—292 4 Claims



1. Apparatus for servicing an air conditioning system, comprising:

compressor means for withdrawing refrigerant from said air conditioning system and for compressing said refrigerant,

means in advance of said compressor means for separating substantially all of any oil, liquid refrigerant and particles in said withdrawn refrigerant from the gaseous component of said refrigerant, said separating means comprising a cap and a body secured thereto, and means for limiting the height of liquid in said separating means,

means for condensing refrigerant received from said compressor means,

means for receiving said withdrawn, condensed refrigerant having an inlet and an outlet, said inlet being at the highest part thereof, and

conduits connecting in series said separating means, said compressor means, said condensing means, and said receiving means,

said condensing means being at a higher elevation than said inlet of said withdrawn refrigerant receiving means.

4,982,577

CRYOGENIC APPARATUS

Bosko Milankov, Mississauga, and John K. Irvine, Etobicoke, both of Canada, assignors to I.Q.F. Inc., Mississauga, Canada

Filed Mar. 19, 1990, Ser. No. 495,633
Int. Cl.[5] F25D *25/02*
U.S. Cl. 62—381 11 Claims

1. An improved cryogenic device, comprising:

an insulated vessel having an outer shell adapted to contain cryogenic liquid;

a reservoir of cryogenic liquid contained in said insulated vessel;

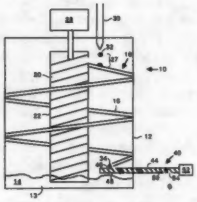
means for dispensing liquid product to be frozen into solid product granules;

a downwardly sloping sluiceway adapted to receive a flow of cryogenic liquid near the top of said sluiceway, and also adapted to receive said liquid product from said dispensing means into the flow of cryogenic liquid, with said sluiceway being located above said reservoir within said vessel;

said flow of cryogenic liquid being adapted to carry said liquid product along said sluiceway and to quickly freeze said liquid product into a solid product in granular form;

separator means adapted to receive the flow of cryogenic liquid and solid product granules from said sluiceway, to separate said product granules from cryogenic liquid, to retain said solid product granules for subsequent extraction and to pass said cryogenic liquid;

wherein said separator means is directly above and in close



proximity to said reservoir such that the length of said flow of cryogenic liquid after it is separated from said solid product granules is minimized;

pump means for transporting said cryogenic liquid from said reservoir and introducing it to said sluiceway via a guide means; and

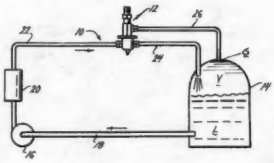
extraction means operating in co-operation with said seperator means for moving said solid product granules from said vessel.

4,982,578

REFRIGERANT PURGE VALVE

Joseph H. Heffner, Chesterfield, and G. Thomas Seener, St. James, both of Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Dec. 22, 1989, Ser. No. 455,965
Int. Cl.[5] F25B *43/04*
U.S. Cl. 62—475 8 Claims



1. A valve for sensing and purging non-condensible gas in a refrigerant, the valve comprising:

(a) a valve body including an inlet and an outlet and a valve passage disposed between said inlet and outlet,

(b) a valve means movably mounted in the valve body for controlling flow through the valve passage,

(c) spring means tending to urge the valve means into an open position,

(d) a flexible motor element carried by the body having opposed sides,

(e) connection means operatively connecting the motor

(f) subjecting one side of said motor element to the pressure of the refrigerant at the inlet and cooperating with the spring means tending to urge the valve means to an open position,

(g) a refrigerant reference charge and means subjecting the other side of the motor element to the pressure of the reference charge tending to close the valve means, and

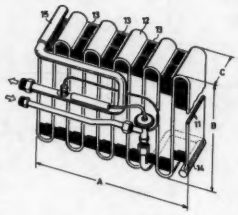
(h) means subjecting the reference charge to the temperature of the refrigerant flowing through the system.

4,982,579

EVAPORATOR

Katsuhisa Suzuki, and Hiroshi Matsubayashi, both of Tochigi, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Mar. 27, 1990, Ser. No. 499,841
Claims priority, application Japan, Mar. 31, 1989, 1-82746
Int. Cl.[5] F25B *39/02*
U.S. Cl. 62—515 3 Claims



1. An evaporator comprising a corrugated fin having flat portions, each of the flat portions being formed with louvers arranged in parallel and extending widthwise of the flat portion, the evaporator being characterized in that the corrugated fin is 0.75 to 0.90 in the ratio of H/P wherein P is the pitch of the flat portions of the fin, and H is the height of the louvers.

4,982,580

CONVERTIBLE ARTICLE OF JEWELRY

Audrey L. Otenbaker, 33758 King Richard, Sterling Heights, Mich. 48310

Filed Aug. 8, 1989, Ser. No. 390,727
Int. Cl.[5] A44C *25/00*
U.S. Cl. 63—2 16 Claims

1. An article of jewelry, comprising:

a base member having a surface which enables a plurality of studded earrings to be removably supported by said base member in an arrangement determined by the user, said studded earrings being readily removable from said base by hand by the user providing for ready rearrangement of the studded earrings by the user, said base member being randomly penetrable over the entire penetrable surface and capable of supporting said studded earrings in a randomly oriented two dimensional arrangement; and

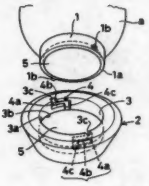
suspension means for allowing the user to wear said article on their person.

4,982,581

COUPLING DEVICE FOR ORNAMENTAL PIECE

Kazuo Furuyama, No. 27-7, Akane-cho, Kashiwa-shi, Chiba-ken, Japan

Filed Jan. 29, 1990, Ser. No. 471,442
Claims priority, application Japan, Oct. 3, 1989, 1-115820[U]
Int. Cl.[5] A44C *17/02*
U.S. Cl. 63—29.1 3 Claims



1. A coupling device for an ornamental piece comprising a base piece adapted to mount the ornamental piece thereon and a receiving member for coupling with said base piece, said base piece and said receiving member being coupled together by fitting and connecting a coupling portion of said base piece into a recess of said receiving member, comprising:

a step-shaped engaging guide groove provided on the internal side surface of said recess of said receiving member, said engaging guide groove comprising an upper groove portion which communicates with a periphery of the surface having an opening of said recess and which extends towards the bottom of said receiving member, an intermediate groove portion which bends from the lower end of said upper groove portion and which extends along the circumferential direction, and a lower groove portion which bends from the remaining end of said intermediate groove portion towards the bottom of said receiving member,

a projection provided on part of the external surface of said coupling portion for fitting into said step-shaped engaging guide groove and then being turned and further pushed in the direction of coupling to thereby detachably couple said base piece and said receiving member, and

attracting magnet pieces opposingly provided on the lower surface of said coupling portion and on the bottom surface of said recess.

4,982,582

TEMPERATURE CONTROL DEVICE FOR A REFRIGERATING CONTAINER

Ikeda Susumu, Gunma, Japan, assignor to Sanden Corporation, Isesaki, Japan

Continuation-in-part of Ser. No. 61,474, Jun. 15, 1987, Pat. No. 4,827,731. This application Sep. 19, 1988, Ser. No. 245,626
Claims priority, application Japan, Jun. 14, 1986, 61-90020; Jun. 14, 1986, 61-90023
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[5] F25D *29/00*
U.S. Cl. 62—115 4 Claims

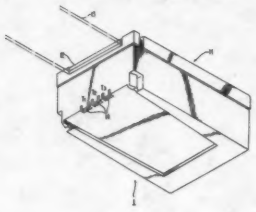
1. A temperature control device for controlling the temperature of refrigerated container which is cooled by a refrigerating apparatus, said temperature control device comprising:

a plurality of temperature level determining switches for selecting a temperature level:

selectively removable cutout portions provided on said refrigerating container for selectively controlling said temperature level determining switches, a selected temperature level being determined by the selective removal from said refrigerated container of said cutout portions;

logic means connected to said switches for outputting a signal indicative of said selected temperature level;

voltage generating means for generating a voltage corresponding to said selected temperature level in accordance with the output of said logic means;



comparative means for comparing said selected temperature level with the actual temperature in said container; and

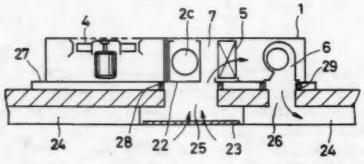
control means for controlling said refrigerating apparatus in accordance with the output of said comparator means.

4,982,583

AIR CONDITIONER FOR RAILWAY VEHICLES

Toshiharu Matsuda; Yoshinao Okumoto, both of Kudamatsu; Nobuyuki Fugiyama, Yamaguchi, and Yoshichika Fukushima, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 386,038, Jul. 25, 1989, Pat. No. 4,905,478, which is a continuation of Ser. No. 185,426, Apr. 25, 1989, abandoned. This application Jan. 16, 1990, Ser. No. 465,891
Claims priority, application Japan, Apr. 30, 1987, 62-104311; Aug. 12, 1987, 62-199750; Oct. 26, 1987, 62-268165
Int. Cl.[5] B60H *1/32*
U.S. Cl. 62—244 4 Claims



1. An air conditioner for railway vehicle for installation on the roof of a vehicle, comprising:

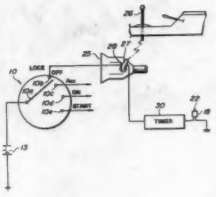
condensers, a condenser fan for supplying air to the condensers, an evaporator, a return air chamber, an evaporator fan for supplying air from the interior of the vehicle to the evaporator by way of the return air chamber, a pressure reducing mechanism, a compressor, and a base frame for supporting the condensers, the condenser fan, the evaporator, the evaporator fan, the pressure reducing mechanism, the return air chamber, and the compressor, and wherein the compressor occupies a smaller area than that of the return air chamber and is disposed in the return air chamber in the air flow of return air taken from the interior of the vehicle by the evaporator fan.

4,982,584

STEERING LOCK SYSTEM

Yoshimitsu Takeda, Zama; Haruo Mochida, Kanagawa; Toshio Kanai, Ayase, and Mikio Masaki, Tokyo, all of Japan, assignors to Nissan Motor Company, Ltd. and Kinzoku Kogyo Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 222,200, Jul. 21, 1988, abandoned. This application Dec. 28, 1989, Ser. No. 456,089
Claims priority, application Japan, Jul. 21, 1987, 62-182021
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—252 8 Claims



1. A steering lock system for a vehicle, comprising:

a selected position sensor for electronically detecting a selected position of a shift lever, operatively connected to an automotive transmission of the vehicle said selected position sensor being adapted to produce a parking position signal when said selected position corresponds to a sensed parking condition for the automotive transmission of the vehicle;

a key cylinder into which an ignition key is insertable in a first position of the key cylinder, said key cylinder being rotatable out of the first position to prevent said ignition key from being pulled out of said key cylinder; and

means for locking a steering mechanism of the vehicle when said key is pulled out of said key cylinder; and

means for controlling operation of said ignition key relative to said key cylinder, said controlling means including

means for enabling said ignition key to be pulled out of said key cylinder only in response to said parking position signal from selected position sensor, and

means for disabling said ignition key from being pulled out of said key cylinder upon absence of said parking position signal,

wherein said enabling means includes means for enabling said key cylinder to rotate to said first position only in response to said parking position signal from said selected position sensor and wherein said disabling means includes means for disabling said key cylinder from rotation to said first position upon absence of said parking position signal, said key cylinder rotation disabling means including a control lever having a control lever engagement projection which is engageable with a key cylinder stopper projection integral with said key cylinder during rotation of said key cylinder toward said first position, upon absence of said parking position signal.

4,982,585

TIMER FOR BANK VAULTS

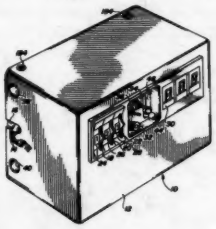
Orin H. Davis, Phoenix, Ariz., and John J. Contus, California City, Calif., assignors to Miss D, Inc., Phoenix, Ariz.

Filed May 2, 1990, Ser. No. 517,938
Int. Cl.[5] E05B *43/00*
U.S. Cl. 70—269 40 Claims

1. A time lock device for a bank vault door having a rectilinearly translating rod, which rod translates as a function of the open and closed position of the vault door, said device comprising in combination:

(a) a body block for receiving the rod when the vault door is in the open position;

(b) a lock block supported by said body block for selectively precluding translation of the rod within the body block, said lock block having a latched position for inhibiting translation of the rod within said lock block and an unlatched position for accommodating translation of the rod within said body block;
(c) mechanical means for positioning said lock block in the latched position;
(d) release means for accommodating repositioning of said lock block into the unlatched position in response to the force of gravity;
(e) a timer for determining the time period after which said release means will be actuated to reposition said lock block to the unlatched position and to permit translation of the rod within said body block to open the vault door;



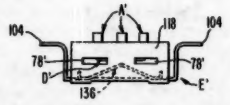
(f) said timer including a constant frequency source for establishing a train of pulses;
(g) at least one counter responsive to the train of pulses for providing a first output signal as a function of an elapsed time period;
(h) at least one settable number generator for providing a second output signal reflective of the time period to elapse before actuation of said release means;
(i) at least one comparator for receiving and comparing said first and second output signals to provide a third output signal upon comparison between said first and second output signals; and
(j) means responsive to said third output signal for actuating said release means upon correspondence between the elapsed time determined by said counter and the set time determined by said generator.

4,982,586

COMBINATION LOCK THAT PREVENTS SHOCK-FORCE RELEASE OF A HASP

Rudolf Wingert, West Milford, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Jun. 1, 1990, Ser. No. 531,753
Int. Cl.[5] E05B *37/02*
U.S. Cl. 70—312 **5 Claims**



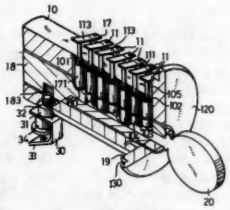
1. A combination lock comprising a bolt pivotally supported at one end, said bolt being disposed at an unlocked position or a locked position spaced therefrom, depending upon whether said lock is on-combination or off-combination, respectively, said bolt having an opposite end adapted to engage a hasp when said bolt is in said locked position and to disengage said hasp when said bolt is in said unlocked position, first spring means for biasing said bolt toward said unlocked position, said bolt being capable of being moved beyond said locked position and farther from said unlocked position by contact of said opposite end of said bolt with said hasp after said hasp has been disengaged from said bolt, and then being returned to said locked position by the bias of said first spring means, whereby said hasp may be re-engaged with said bolt when said lock is off-combination, and second spring means for resiliently restraining movement of said bolt beyond said locked position to prevent disengagement of said hasp from said bolt in response to application of a shock force to said lock.

4,982,587

ELECTRONICALLY SELF-LATCHING CYLINDER LOCK

Kae M. Tzou, 3 Fl., No. 181, Sec. 5, Chung Hsiao E. Rd., Taipei, Taiwan

Filed Apr. 11, 1990, Ser. No. 507,479
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] E05B *49/00*
U.S. Cl. 70—492 **8 Claims**



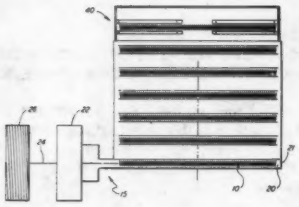
1. An electronically self-latching cylinder lock comprising a cylinder into which a plug with a key way is inserted, a plurality of pin tumblers each of which is disposed in one of a plurality of bores formed inside said cylinder as well as said plug and extending to said key way, a plurality of switches associated with said pin tumblers, a latching means, a warning means, and an electronic circuit which is controlled by said switches to drive said latch means and said warning means, and characterized in that:
each of said switches is constituted by a spike, which is fixed on an associated pin tumbler of said pin tumblers and protrudes out of said cylinder, and a resilient conductor which is fixed to said cylinder via an insulator so that when said spike is caused to move further out of said cylinder by said associated pin tumbler, said spike will contact said resilient conductor to form a closed electrical loop;
said cylinder lock further comprises a control pin which has an associated switch including a spike fixed on said pin and a resilient conductor fixed on said cylinder via an insulator and which is disposed inside a bore formed inside said cylinder with the lower end thereof contacting a slot formed on the surface of said plug so that when said plug is rotated, said slot will be inclined and said control pin will be driven to have said spike thereof contact said resilient conductor;
said latching means is so installed that when actuated by said electronic circuit, said latching means will latch said plug and prevent said plug from being rotated;
said warning means is so connected to said electronic circuit that when said latching means is actuated, said warning means is also actuated to send out warning signal;
said electronic circuit is so connected that when any one of said pin tumblers is moved to have the associated spike contact the associated resilient conductor, the latching means and the warning means will be actuated if the spike of said control pin does not contact its associated resilient conductor in a given time interval to disable the electronic circuit.

4,982,588

ELECTRIC HEATER COIL FORMING AND TRANSPORTING APPARATUS

Lisa Hayes, Pomona, Calif., and Arthur Evans, Sherburne, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 21, 1989, Ser. No. 454,478
Int. Cl.[5] B21F *3/02, 35/00*
U.S. Cl. 72—134 3 Claims



1. An apparatus for forming and supporting an electric resistance heating coil at a coil forming station and then transferring the heating coil to a second station for performing a second manufacturing operation on the heating coil, the apparatus comprising:

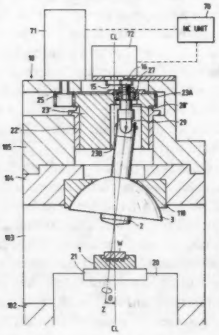
a coil forming means for forming electric resistance wire into a helical coil of desired resistance whereby adjacent windings of said helical coil have a desired spacing along the entire length of said helical coil, a support means positioned adjacent the coil forming means for receiving and supporting a singular helical coil during forming of said helical coil having the desired spacing between adjacent windings and vibrating means for vibrating said support means as said singular coil is received thereon to reduce the frictional forces between said coil and said support means to provide free movement of said helical coil along a length of said support means whereby a helical coil of desired resistance and spacing between adjacent windings is formed.

4,982,589

SWIVELING TYPE PLASTIC WORKING MACHINE

Hiroaki Nomura, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 7, 1990, Ser. No. 476,568
Claims priority, application Japan, Feb. 14, 1989, 1-34558; Jul. 5, 1989, 1-173606
Int. Cl.[5] B21J *13/02*
U.S. Cl. 72—67 12 Claims



1. In a swiveling type plastic working machine including a frame which provides a vertical axis, a first die, a die holder for mounting the first die, and a second die confronting the first die for mounting thereon a workpiece, the workpiece being depressed by co-operation of the first and second die, thereby applying a plastic working to the workpiece, the improvement comprising:

the die holder provided obliquely with respect to the vertical axis, the die holder having its slanted axis and having one end portion and another end portion to which the first die is fixed, the workpiece being positioned at a generally intersecting point between the vertical axis and the slanted axis;

means for circularly moving the one end of the die holder to provide a swiveling motion thereof about the vertical axis, said means comprising a first servo motor; and

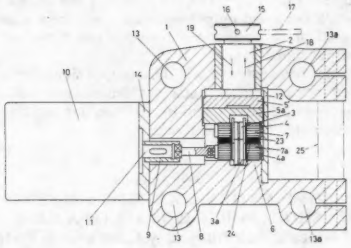
means for controlling a self-rotation of the die holder about its slanted axis during swiveling movement of the die holder, said means comprising a second servo motor for rotating the die holder about the slanted axis, and a numerical control means for controlling the first and second servo motors.

4,982,590

ROLL-FORMING APPARATUS FOR WIRE STOCK

Keiichiro Yoshida, 497, Shimonagayoshi, Mobara, Chiba, Japan

Filed Jul. 20, 1988, Ser. No. 221,917
Claims priority, application Japan, Jul. 20, 1987, 62-180488; Jul. 23, 1987, 62-184388
Int. Cl.[5] B21B *13/00*
U.S. Cl. 72—235 17 Claims



1. A roll-forming apparatus for roll-forming thin wire stock, comprising:

a frame structure;

roller means, comprising a pair of mating rollers mounted in parallel in a central position within said frame structure for rolling the thin wire stock between said rollers;

pressure force supply means, mounted on an upper portion of said frame structure for imparting an adjustable amount of pressure force to said roller means;

two roller shafts respectively rotatably supporting said rollers for rotation about respective axes, each of said roller shafts being mounted along said respective axes and perpendicularly to the direction of the pressure force adjustably imparted by said pressure force supply means;

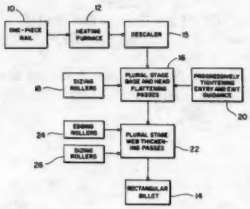
drive power shaft means coupled with one of said roller shafts for driving one of said rollers; and

wherein said frame structure has one side thereof open, and includes fastening means at the four corners thereof for securing said frame structure in position.

4,982,591
RAIL RECYCLE PROCESS

Darrell B. McGahhey, El Paso, Tex., assignor to W. Silver, Inc., El Paso, Tex.

Filed Dec. 20, 1988, Ser. No. 286,945
Int. Cl.[5] B21B *1/08*
U.S. Cl. 72—234 **3 Claims**



1. In a method of recycling a one-piece rail having a base portion and a head portion spaced from each other along an axis by a substantially flat web portion, said method comprising

heating the rail to a plastic state,

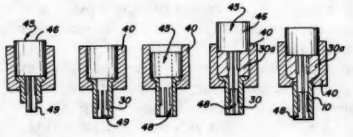
feeding the heated rail between sizing and edging rollers to deform the same into a cross-sectionally useful billet,

said feeding step including an initial group of rolling passes successively flattening only the base portion and the head portion of the rail between the sizing rollers to extend the web portion along said axis to form an elongated slab and then feeding the elongated slab to a second group of rolling passes alternating between edging rollers and sizing rollers where the slab is initially centrally thickened by edging rollers to prevent buckling and then ultimately forming said billet.

4,982,592
METHOD OF EXTRUDING CHANNELED SLEEVES

Joseph A. Simon, 30855 Little Mack Ave., Boseville, Mich. 48066

Filed Mar. 8, 1990, Ser. No. 490,281
Int. Cl.[5] B21C *23/10, 25/04*
U.S. Cl. 72—260 **7 Claims**



1. A process for extruding a thin wall, tubular metal sleeve having an interior wall surface with at least one full length channel formed in, and extending along the full length of, its interior wall surface and at least one other, partial length channel formed in and extending along the wall surface and spaced inwardly a distance from the opposite ends of the sleeve, comprising:

placing a short, tubular metal blank having a leading end portion and a trailing end portion and an intermediate portion between the end portions, within an open ended tubular die having an entry end through which the blank is placed, and an opposite exit end formed as an annular, radially inwardly extending, continuous shoulder surrounding an exit opening defining a die extrusion throat through which the blank is longitudinal extruded;

inserting a punch into the die entry end, with a punch having a body portion that is closely fitted within the die for axially directed movement relative to the die throat and with an annular shoulder for engaging against the trailing end of the blank, that is, the end nearest the die entry end, and with the punch being provided with an axially extending extension portion having a leading end section and a trailing end section, and with at least one elongated longitudinally extending tooth formed on the leading section and at least two longitudinally extending teeth formed on the extension trailing section, and the tooth on the leading section being longitudinally aligned with one of the teeth on the trailing section;

positioning the punch leading extension section within the die throat and within the blank leading end portion;

moving the punch towards the die throat to push the blank leading end portion through the die throat, around the punch leading end section, and with the cross section of the die throat being smaller than the cross section of the blank, so as to sequentially collapse the blank leading end portion around the extension leading end section so that the leading end section tooth forms a channel extending longitudinally of the blank inner wall surface;

next, moving the punch trailing end section within the die throat area and moving the punch towards the die throat so that the blank intermediate portion passes through the throat and around the punch extension trailing end section to continue forming the channel that was formed by the punch extension leading end tooth while also forming a separate channel in the blank intermediate portion;

removing the punch and placing a second blank within the die, with its leading end portion arranged against the trailing end portion of the first mentioned blank;

repositioning the punch within the die with its leading end section positioned within the die throat area and within the trailing end portion of the first mentioned blank and moving the punch towards the die throat so that its shoulder pushes the second blank which, thereby, pushes the first mentioned blank completely through the die throat to form a continuation of the longitudinally aligned channels formed in the blank leading edge portion and intermediate portion and for discontinuing the formation of the second, partial channel, formed in the blank intermediate portion; and

whereby a continuous longitudinal channel extending the length of the sleeve and a longitudinally extending, partial channel located entirely within the intermediate portion of the sleeve are produced.

4,982,593
GRIPPER MEANS FOR STRETCHER LEVELER APPARATUS

Bertram A. Holloway, Washington, Pa., assignor to Washington Steel Corporation, Washington, Pa.

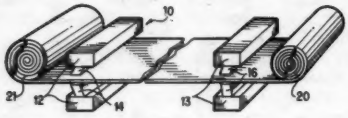
Continuation-in-part of Ser. No. 819,028, Jan. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 485,275, Apr. 15, 1983, abandoned. This application Jul. 6, 1989, Ser. No. 376,387
Int. Cl.[5] B21D *25/04*
U.S. Cl. 72—302 **7 Claims**

1. A stretcher leveler apparatus capable of applying up to 250,000 pounds of force comprising a first gripping jaw adapted to be closeable with an identically aligned second gripping jaw, whereby both jaws of a first pair can hold firmly one section of an uncoiled metal strip passing therebetween during the periods of high stress elongation of the strip length lying between the first pair defining one end of the metal strip and a second pair of opposing gripping jaws operating simultaneously at a distance from the first pair of jaws and forming the second end of the elongating strip section to be elongated, the improvement comprising each jaw having a gripper means consisting essentially of

a. a high density, cast polyurethane gripping surface adapted for engagement with the metal section to be stretched and operatively anchored to the contact jaw faces, said grip-

ping surface being positioned in a plane parallel to the surface of the metal to be engaged, and

b. said gripping surface includes an integral reinforcing means made of steel adapted to maintain the transverse rigidity of the said surface during coil engagement and the



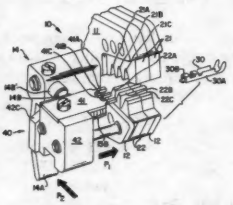
forces incident to elongation of a strip length when up to 250,000 pounds of force are applied to the metal through the jaws, said gripping surface being operatively anchored to each jaw through the reinforcing means, said gripping surface being cast in situ on the reinforcing means.

4,982,594

LOCATOR FOR A CRIMPING TOOL

Ulrich Wiebe, Döretrup, Fed. Rep. of Germany, assignor to C.A. Weidmuller GmbH & Co., Fed. Rep. of Germany

Filed Nov. 9, 1989, Ser. No. 435,300
Claims priority, application Sweden, Nov. 11, 1988, 8804084
Int. Cl.[5] B21D *7/06, 43/26*
U.S. Cl. 72—416 **15 Claims**



15. A locator for a crimping tool with a pair of jaw carriers movable toward and apart from one another, a pair of jaws mounted in said pair of carriers, and each of which comprises a plurality of die elements, juxtaposed die elements in the two jaws defining pairs of dies co-operating for crimping on electrical conductor connectors which have an attachment part and a contact part, the locator member comprising, in combination:

at least one guide bar having a first end and a second end and attachable at the first end to one side of one of the jaw carriers;

carrier block means surrounding said guide bar and reciprocally movable along said guide bar between a stand-by position adjacent said first end, and a rest position;

a plurality of grip elements, corresponding to the number of die pairs, mounted side by side on said carrier block means and extending toward the respective die pairs;

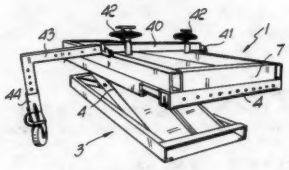
manually operable driving means for moving the carrier block means from its rest position, in which each grip element is located completely outside the jaw area, into the stand-by position, in which each grip element is located in the space between the open jaws, each grip element being disposed in height position relative to the guide bar such that in the stand-by position of the locator an air gap, greater than the thickness of the material of the connector, is obtained between the respective die and a connector carried by the grip element, so that the juxtaposed dies surround the locator to define said air gap.

4,982,595

APPARATUS FOR REPAIRING DAMAGED VEHICLES

Francesco Fiorese, Via S. Andrea 50, 35020 Albignasego (Province of Padova), Italy

Filed Nov. 20, 1989, Ser. No. 440,561
Claims priority, application Italy, Nov. 18, 1988, 41713 A/88
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—447 **16 Claims**



1. Apparatus for repairing damaged vehicles, comprising;

a frame for supporting, by means of template means being connected to said frame, a vehicle to be repaired, said frame being supportable on the ground and defining a plane of lay being positionable substantially parallel to the ground, said frame being positionably movable in a substantially vertical direction,

a raising and lowering mechanism means for raising and lowering said frame in the vertical direction,

traction means for putting into straightening traction damaged bodywork of a vehicle to be repaired, said traction means being supported by traction support means, said traction support means being positionably connected with said frame,

at least two vehicle-holder crosspiece means being slidable on said frame,

vehicle lifting means being connected to said crosspiece means and acting with said slidable crosspiece means for lifting and positioning a vehicle to be repaired onto said template means,

wherein said crosspiece means comprise adjustable-height rolling element means being connected at ends of said crosspiece means, said adjustable-height rolling element means being vertically adjustable and having free rolling ends for rolling contact with the ground for giving support to said crosspiece means in any vertical position of said frame.

4,982,596

DIE FOR MANUFACTURING A FASTENER BLANK

Francis C. Peterson, Woodbury, and Dennis Buss, Thomaston, both of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

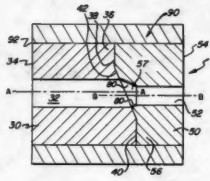
Filed Jan. 26, 1990, Ser. No. 470,920
Int. Cl.[5] B21K *1/56;* **B23G** *9/00*
U.S. Cl. 72—467 **24 Claims**

1. A die for manufacturing a fastener blank with a reduced, asymmetric or offset section, comprising:

a first die section having a first bore therethrough, said first bore having a central axis and a diameter, said first die section having a free end and a non-planar joining end wherein said first die section joining end comprises two substantially parallel planar section connected by a third planar section intersecting said two substantially parallel

planar sections, said first bore intersecting said third planar section of said first die section joining end;

a separate second die section having a second core therethrough, said second die section having a free end and a non-planar joining end adapted to mate with said first die section joining end wherein said second die section joining end comprises two substantially parallel planar sections connected by a third planar section intersecting said two substantially parallel planar sections which match the



joining end of said first die section joining end, said second bore intersecting said third planar section of said second die section joining end, the end of said second bore at said second die section joining end being shaped to form said reduced, asymmetric or offset section, said first and second bores forming a unitary bore for forming a fastener blank therein; and

a layer of a hard material coating at least a portion of said shaped second bore end.

4,982,597

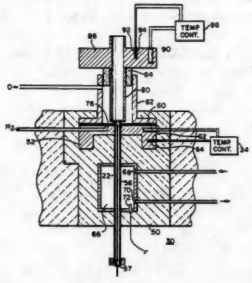
RESTRICTOR HEATING IN SUPERCRITICAL FLUID CHROMATOGRAPHY

Terry A. Berger, Landenburg, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 207,336, Jun. 7, 1988, abandoned. This application Jul. 10, 1989, Ser. No. 377,534

Int. Cl.[5] G01N *30/30, 30/32*

U.S. Cl. 73—23.1 **14 Claims**



1. In a chromatographic analysis system, apparatus for maintaining the temperature of the mobile phase at a desired level, comprising in combination a restrictor, through which the mobile phase passes, said restrictor having a minimum taper length; and heated zone means for creating a temperature zone in an area immediately prior to the outlet end of said restrictor, said temperature zone having a length equal to the minimum length necessary to transfer sufficient heat to said mobile phase so that as said mobile phase passes through said zone, the temperature of said mobile phase is maintained at said desired level.

4,982,598

APPARATUS FOR MEASURING THE PARTIAL PRESSURE OF GASES OR VAPORS

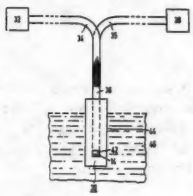
Franz Dickert, Nuremberg; Heinz Kimmel, Buckenhof; Gert Mages, Hemhofen, and Sabine Schreiner, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 323,584, Mar. 14, 1989, Pat. No. 4,926,156. This application Dec. 23, 1989, Ser. No. 458,340

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808470

Int. Cl.[5] G01N *27/00;* **H01C** *10/10*

U.S. Cl. 73—29 **6 Claims**



1. An apparatus for continuously measuring the partial pressure of gases or liquids with a chemically sensitive sensor material, having an electric resistance or dielectric constant that changes in response to a change in the partial pressure of the gas or liquid comprising:

a light source;

a receiver;

a first set of light guides having one end in communication with the light source and other end exposed;

a second set of light guides having one end in communication with the receiver and the other end exposed and arranged in a common plane with the exposed end of the first set of light guides;

a reflector covering the exposed ends of the first and second set of light guides;

a sensor material selected from the group consisting of a metal complex having at least one hydrophobing ligand or a mixture of at least one phthalide with at least one acidic component in communication with the reflector;

a casing covering the reflector and the sensor material;

a gas permeable membrane on at least one side of the casing; and

a measuring solution, containing the gas or liquid, surrounding the casing.

4,982,599

ACCELERATION DETECTOR

Satoshi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 316,824

Claims priority, application Japan, Feb. 29, 1988, 63-25182[U]

Int. Cl.[5] G01L *23/22;* **G01P** *15/09*

U.S. Cl. 73—35 **7 Claims**

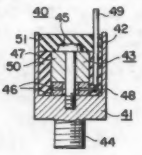
1. An acceleration detector for an internal combustion engine, comprising:

a generally cylindrical housing including a base portion and an outer wall upstanding therefrom to define an annular, open ended cavity therein, said base portion including means for mounting the housing to an internal combustion engine;

an acceleration transducer assembly disposed in said cavity and including an annular piezoelectric element and an annular inertial weight arranged in an axial stack with the piezoelectric element adjacent said base portion;

a resilient filler material applied around said acceleration transducer assembly for resiliently supporting said accel-

eration transducer assembly relative to said housing, said resilient filler material being sufficiently resilient to allow the movement of said inertial weight relative to said housing when an acceleration is applied to said inertial weight, and filling said cavity to a level proximate an upper end of the inertial weight; and



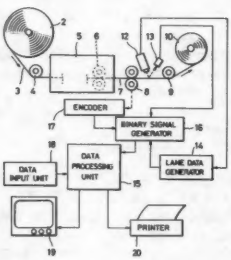
a relatively hard, substantially non-resilient sealing material applied on and overlying said resilient filler material for sealing and covering said resilient filler material, said sealing material filling a remaining space within said cavity up to said open end thereof.

4,982,600

METHOD OF MEASURING THE PERIOD OF SURFACE DEFECTS

Takeshi Kiso, Kanagawa, and Takanori Masuda, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1989, Ser. No. 405,215
Claims priority, application Japan, Sep. 9, 1988, 63-226190
Int. Cl.[5] G01B *21/30*
U.S. Cl. 73—104 **3 Claims**



1. A method of measuring the period with which a defect in a surface of a web moving in a lengthwise direction thereof recurs, said method comprising the steps of:

moving a web relative to a scanning device to collect data on the positions of a plurality of said defects for a predetermined length of said web;

obtaining data on the distances of said plurality of defects from each other, and

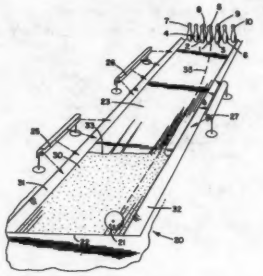
indicating that said web has a periodic defect recurring with a period between predetermined maximum and minimum periods when said distance data include a distance equivalent to an elemental period which is a whole-number multiple of a fundamental period.

4,982,601

METHOD FOR THE VISUAL DISPLAY OF THE MIGRATION OF BOWLING LANE OIL DURING PLAY

James D. Troxell, P.O. Box 123, Cuyahoga Falls, Ohio 44222

Filed Dec. 5, 1989, Ser. No. 446,178
Int. Cl.[5] B23Q *17/09*
U.S. Cl. 73—104 **11 Claims**



1. A method for displaying the migration of lane oil over bowling alleys during play comprising the steps of:

incorporating an additive into the lane oil that is non-discernable when viewed with ambient light;

applying said lane oil and incorporated additive to the surfaces of a bowling alley in a conventional manner; and

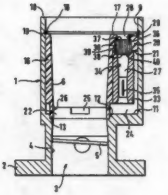
selectively illuminating said surfaces with light from a portion of the electromagnetic spectrum having a wavelength to which said additive is responsive, thereby rendering detectable the presence of said lane oil and the migration thereof over the bowling alley.

4,982,602

AIR METERING DEVICE

Hans-Peter Stiefel, Ditzingen, and Kurt Frank, Schorndorf-Haubersbronn, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 27, 1989, Ser. No. 441,721
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905746
Int. Cl.[5] G01F *1/68*; G01M *15/00*
U.S. Cl. 73—118.2 **10 Claims**



1. An air metering device for metering an amount of air sucked in by an internal combustion engine via an air flow tube, comprising, a main flow channel member including a main flow channel having a large diameter end portion and a small diameter end portion, a flow tube (16) inserted into said large diameter end portion and designed to form a Venturi-shaped flow zone of said main flow channel, a bypass formed between said Venturi-shaped flow zone and said large diameter end portion, said bypass including a bypass channel (27) having an inlet opening disposed upstream of a narrowest cross section of said Venturi-shaped flow zone, said bypass channel includ-

ing therein, in series, in an air flow direction, a filter and a temperature-dependent measuring resistance downstream of said filter, a collar (20) that surrounds said filter in said bypass juxtaposed said inlet opening (28), said bypass channel including a first zone (29) formed in said collar (20) upstream of said filter, said bypass channel includes a second zone formed by said filter (30) and a third zone (34) formed in a slide-in member (33) which is in abutment with a downstream end of said filter and a downstream end abutment face (21) of aid collar (20); said abutment face (21) being oppositely directed with respect to the inlet opening (28) of the bypass channel (27), said temperature-dependent measuring resistance (35) being mounted in said third zone of said slide-in member (33), said filter (30) being held with its first end face (37) toward said inlet opening in a retaining opening (36) in said collar (20) in such a way that its second end face (38) directed towards said slide-in member (33) abuts against the slide-in member (33) and is axially secured by said slide-in member so that there is no airflow-distorting edge located between said second end face (38) of said filter and said temperature dependent measuring resistance (35).

4,982,603

QUALITY ASSURANCE TEST UTILIZING AN AMINO FUNCTIONAL ORGANOSILICON OPTICAL BRIGHTENER

Peter Y. K. Lo, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 176,967, Apr. 4, 1988, Pat. No. 4,866,152. This application Feb. 3, 1989, Ser. No. 305,582

Int. Cl.[5] G01B *21/30*

U.S. Cl. 73—150 R **17 Claims**

1. A quality assurance test method for indicating the extensiveness of a silicone treatment upon a substrate, which treatment is otherwise invisible under normal light conditions, comprising the steps of treating the substrate with a fluorescent compound derived from the reaction of an aminofunctional organosilicon compound selected from the group consisting of polysiloxane and silanes, with a compound selected from the group consisting of fluorescent functional organosulfonic acids and fluorescent functional organoaldehydes, and examining the treated substrate for fluorescence under ultraviolet light.

4,982,604

METHOD AND SYSTEM FOR TESTING THE DYNAMIC INTERACTION OF CORING FLUID WITH EARTH MATERIAL

R. Michael Davis, Bedford; Eve S. Sprunt, Farmers Branch, and M. Scott Quigley, Plano, all of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 20, 1989, Ser. No. 439,293

Int. Cl.[5] E21B *49/00*

U.S. Cl. 73—153 **16 Claims**

4. A system for testing the dynamic interaction of a coring fluid and a material sample representative of a subsurface formation, comprising:

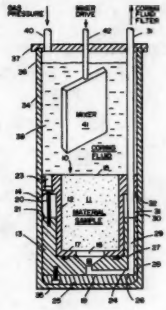
(a) a material sample holder,

(b) an opening in an upper end of said holder through which said holder may be filled with a material sample representative of a subsurface formation and through which said material sample is directly and dynamically interacted with a coring fluid;

(c) a fluid drain in the lower end of said holder through which coring fluid filtrate passes after dynamic interaction of said coring fluid with said material sample,

(d) a test cell housing said material sample holder in a lower portion thereof and said coring fluid in a top portion thereof, said coring fluid being in direct contact with said material sample through said opening in the upper end of said holder, and

(e) a means associated within said upper portion of said test cell for agitating said coring fluid to provide the dynamic



interaction between said coring fluid and said material sample.

4,982,605

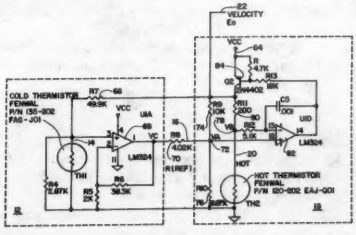
AIR FLOW MONITOR AND TEMPERATURE COMPENSATING CIRCUIT THEREFOR

James W. Oram, Lombard; Price R. Hodson, Glen Ellyn, and Paul F. Haake, Highland Park, all of Ill., assignors to Alnor Instrument Company, Skokie, Ill.

Filed May 17, 1989, Ser. No. 352,979

Int. Cl.[5] G01F *1/68; F24F 11/04*

U.S. Cl. 73—204.19 **10 Claims**



1. A method of monitoring fluid flow in a fume hood having a front face, an interior and an exhaust therefrom, comprising:

coupling a fluid flow tube between the face of the fume hood and the interior thereof;

providing a pair of thermistors in said fluid flow tube;

heating a first one of said thermistors and passing fluid thereover;

sensing and measuring the face fluid flow velocity of said fume hood by monitoring the resistance change in said heated thermistor; and

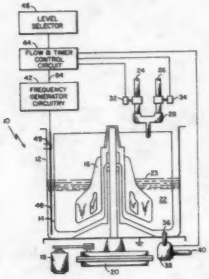
compensating for changes in ambient temperature by adding or subtracting current flow in relation to resistance changes in a second unheated one of said thermistors located in said fluid flow.

4,982,606

FLUID LEVEL SENSOR AND CONTROLLER

Joseph R. Adamski, Sudbury, Mass., and Donald A. Coates, Green Lake, Wis., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 6, 1989, Ser. No. 319,380
Int. Cl.[5] G01F *23/26;* G01R *27/26*
U.S. Cl. 73—304 C 18 Claims



1. An apparatus for sensing the level of liquid in a container comprising:

first and second parallel metal plates having opposingly facing flat surfaces and providing a capacitance;

means for supporting said plates inside said container;

insulating spacing means, attached to said first and second plates for maintaining a constant spacing between said first and second plates; and

means electrically coupled to said plates for detecting said capacitance and for generating in response to said capacitance a signal indicating the level of liquid in said container;

wherein said first and second parallel metal plates are shaped to support said detecting and signal generating means.

4,982,607

COMPOSITE CYLINDER FOR A MINI OIL PRESSURE TRANSDUCER

Joseph T. Betterton, Arab; Alfred H. Glover, Decatur, and Thomas S. McKee, Madison, all of Ala., assignors to Acustar, Inc., Troy, Mich.

Filed Mar. 29, 1990, Ser. No. 501,224
Int. Cl.[5] G01L *7/08, 9/02*
U.S. Cl. 73—725 12 Claims

11. An improved fluid pressure transducer, comprising:

generally hollow first and second housing members attached together in an end-to-end manner;

a diaphragm member with an edge portion and a flexible mid-portion, said edge being attached between said housings and said mid-portion having first and second surfaces whereby said first surface is exposed to pressurized fluid thereby generating a net pressure force on said mid-portion;

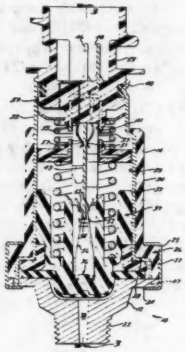
a piston member having an end portion operatively attached to said mid-portion of said diaphragm, an integral tubular portion of said piston extending within said second housing, whereby said piston is supported for axial reciprocation in said interior of said second housing corresponding to the movements of said mid-portion;

said second housing having generally concentric interior and exterior portions, said interior portion being formed from a metal and said exterior portion being formed from a plastic;

said interior metal portion of said second housing having a plurality of grooves formed therein;

said piston member having a plurality of bosses formed thereon to be engagably positioned within said grooves of said second housing;

said internal metal portion of said second housing, providing an electrical ground path to said first housing; and



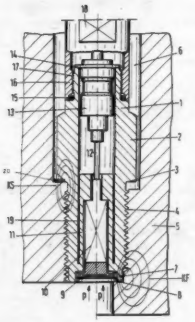
said external plastic portion of said second housing member being formed with a hexagonal exterior surface shape.

4,982,608

HIGH-PRESSURE TRANSDUCER

Balz Märki, Winterthur, and Peter Wolfer, Kleinandelfingen, both of Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland

Filed Nov. 2, 1989, Ser. No. 430,335
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 8903667[U]
Int. Cl.[5] G01L *7/08, 9/04*
U.S. Cl. 73—756 13 Claims



1. High pressure transducer to be mounted in either a first or second distinct type of mounting hole in a component comprising:

a transducer body;

a sensor means mounted to said transducer body;

a diaphragm means mounted to said sensor means and transducer body;

first means integral to said transducer body for forming a shoulder seal only with a first type of mounting hole; and

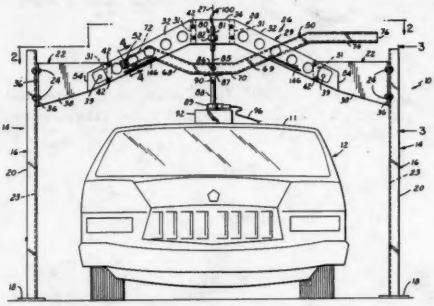
second means integral to said transducer body for forming a seal at a front end of said transducer body only with a second type of mounting hole.

4,982,609

TEST DEVICE FOR VEHICLE ROOF STIFFNESS

Walter D. Talley, III, Mount Clemens, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 26, 1990, Ser. No. 500,448
Int. Cl.[5] G01N 3/20
U.S. Cl. 73—849 7 Claims



1. A testing apparatus for measuring roof panel stiffness of an automobile vehicle steel body, the apparatus comprising:

a cross beam measuring assembly comprising a symmetrical arch beam member and a force applying trough-shaped lever arm, said arch beam member adapted to be positioned by a pair of laterally spaced support means in a transverse vertically spaced manner above the roof panel of said vehicle body, said cross beam assembly arch beam member having first and second outwardly and downwardly diverging mirror image flank sections interconnected by a horizontal arch beam member center section, whereby said center section has its midpoint coinciding with the longitudinal plane of symmetry of said vehicle body;

said trough-shaped lever arm formed with outwardly and upwardly diverging first short and second long flank sections interconnected by a lever arm center section, means pivotally mounting said lever arm first short flank section on said arched beam member first flank section for pivoting in a transversely extending vertically disposed plane including the transversely extending vertically disposed medial plane of symmetry of said arch beam member;

said lever arm second long flank section having its outboard end connected to a loading limb projecting outboard in substantially parallel relation to said lever arm center section so as to overlie an associated one of said pair of support means, whereby said lever arm center section is disposed in substantially parallel vertically spaced subjacent relation to said arch beam member center section with said cross-beam measuring assembly in its zero setting;

linear displacement transducer measuring means interconnected between said arch beam member center section and said lever arm center section for measuring the downward movement of said lever arm center section relative to said arch beam member center section related to downward forces applied to said lever arm loading limb;

rod means pivotally mounted in a vertically disposed manner on said lever arm center section, said rod means having compression load cell measuring means fixed on its lower end, spacer means positioned intermediate said load cell measuring means and a central exterior surface portion of said vehicle body roof panel with said cross-beam assembly lever arm in its zero setting; and

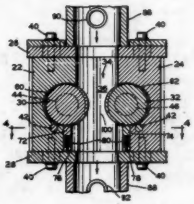
whereby upon the application of a predetermined downward incremental force to said lever arm loading limb said load cell measuring means senses a resultant amplified force applied via said spacer means to said vehicle body roof panel central portion, said resultant amplified force being directly proportional to said predetermined downward incremental force applied to said lever arm causing a corresponding downward deflection of said vehicle body roof panel central portion.

4,982,610

DEVICE FOR MEASURING THE FLOW OF A GAS CONTAINING PARTICULATES

Roy G. Gordon, Cambridge, Mass., and Peter H. Hofer, Perrysburg, Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Aug. 25, 1989, Ser. No. 398,718
Int. Cl.[5] G01F 1/42
U.S. Cl. 73—861.62 17 Claims



1. Apparatus for continuously measuring the flow of a gas containing entrained particulates, comprising:

(A) a flow channel, through which the gas flows;

(B) an orifice disposed within the flow channel, including at least a first surface and a second surface;

(C) means for causing the first surface and second surface independently to move in directions perpendicular to lines normal to the surfaces;

(D) scraping means, for intimately contacting at least a portion of the first surface and of the second surface, at all times while the surfaces are moving, whereby particulates which adhere to the first and second surfaces are removed by the movement of the surfaces past the scraping means;

(E) pressure taps, positioned so as to communicate with the flow channel upstream and downstream from the orifice, the pressure taps additionally in communication with pressure-measuring means, for measuring the pressure differential in the flow channel resulting from the passage of the gas through the orifice; and

(F) thermophoretic heaters, positioned so as to heat the gas within the pressure taps, and thereby excluding particulates therefrom.

4,982,611

MULTIPLE-DEGREE-OF-FREEDOM SENSOR TIP FOR A ROBOTIC GRIPPER

Robert D. Lorenz, Madison, Wis., and Douglas M. Van De Riet, Holland, Mich., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

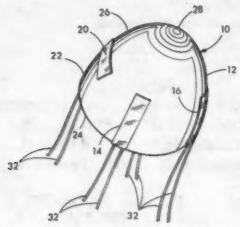
Filed May 24, 1988, Ser. No. 198,193
Int. Cl.[5] G01L 5/16
U.S. Cl. 73—862.04 39 Claims

1. A sensor tip for use in a robotic hand which is capable of manipulating an object, the sensor tip providing feedback information to the robot on forces acting upon the sensor tip by the object, the sensor tip comprising:

(a) an elastomeric body having a three-dimensional outer boundary that contacts the object being manipulated, the body being formed of a relatively compliant material as compared to the object to be manipulated; and

(b) means for measuring strain in the elastomeric body at at

least two positions near the outer boundary of the body to yield information on a plurality of independent force or



torque components acting upon the sensor tip by the object being manipulated.

4,982,612

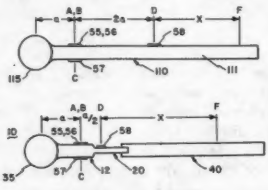
TORQUE WRENCH WITH MEASUREMENTS INDEPENDENT OF HAND-HOLD POSITION

Nancy C. Rittmann, Racine, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Oct. 3, 1988, Ser. No. 252,659

Int. Cl.[5] B25B *23/142*

U.S. Cl. 73—862.23 **18 Claims**



1. A torque measuring wrench for measuring the torque applied to a structure comprising: an elongated deflection beam having coupling means at one end thereof for engagement with the associated structure and having handle means at the other end thereof, gauge means for measuring and indicating torque applied to the associated structure at said coupling means in response to a force applied to said handle means, said gauge means including a plurality of strain gauges having substantially the same gauge factor disposed along said beam and connected in a measuring bridge, at least one of said strain gauges being disposed at a first distance from said coupling means and at least one of said strain gauges being disposed at a second distance from said coupling means greater than said first distance, and means associated with each of said strain gauges disposed at said second distance for weighting the measurement thereby greater than the measurements by the ones of said strain gauges disposed at said first distance.

4,982,613

FORCE SENSOR

Manfred A. Becker, Frankenthal, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Nov. 27, 1989, Ser. No. 441,856

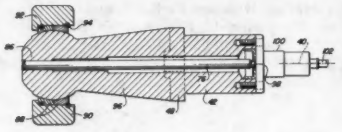
Claims priority, application European Pat. Off., Dec. 24, 1988, 3843869

Int. Cl.[5] G01L *1/26, 5/13*

U.S. Cl. 73—862.64 **9 Claims**

1. In a force sensor having a hollow bendable body having a fixed end and a free end to which a force may be applied in a direction perpendicular to a longitudinal axis of the body by a link connected thereto, a gage rod received by the body and having a first end fixed to the free end of the body and a second free end, and a displacement transducer for generating an output signal representing displacement of the rod free end with respect to the body fixed end, characterized by:

the cross sectional area of the body increases from its free end to the fixed end, and the body has a central portion which has a cross section which is thicker in a direction



perpendicular to a line through which forces are transmitted to the body free end and which is thinner in a direction parallel to said line.

4,982,614

PROCESS OF TAKING LIQUID FROM LARGE-VOLUME, DEEP VESSELS BY MEANS OF SUCKING VESSELS AND AUXILIARY SUCKING DEVICE FOR USE WITH LARGE-VOLUME, DEEP VESSELS IN CARRYING OUT THAT PROCESS

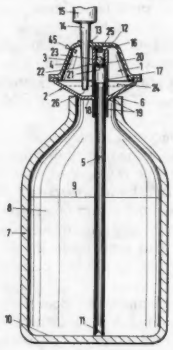
Heinz-Jürgen Gora, Hamburg, Fed. Rep. of Germany, assignor to Eppendorf-Netheler-Hinz GmbH, Hamburg, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 358,444

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818238

Int. Cl.[5] G01N *1/00*

U.S. Cl. 73—863.81 **9 Claims**



1. A process of taking liquid from a supply vessel by means of a sucking vessel which has a sucking element which is shorter than the supply vessel and through which liquid is sucked from a liquid supply of changing depth in the supply vessel, characterized by providing at least part of a defined stand-by volume of liquid in a space disposed outside said supply vessel and accessible from above by performing at least one sucking step to suck liquid from said supply vessel for providing in said space said stand-by volume of liquid in a defined depth, and to suck a controlled quantity of liquid as a liquid sample from said stand-by volume contained in said space.

4,982,615

STERILE CONTAINER FOR COLLECTING BIOLOGICAL SAMPLES FOR PURPOSES OF ANALYSIS

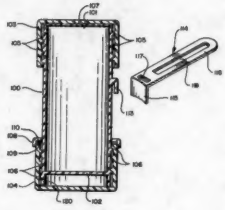
Bernard Sultan, 1 à 3 rue Solférino, Colombes (Hauts de Seine), and Pierre Muraz, 321 avenue d'Argenteuil, Bois Colombes (Hauts de Seine), both of France

Filed Apr. 18, 1989, Ser. No. 339,652

Claims priority, application France, Apr. 18, 1988, 88 05100

Int. Cl.[5] G01N *1/12*

U.S. Cl. 73—864.51 14 Claims



1. A device intended to facilitate the taking of an excretal biological sample while eliminating the risks of contamination of the biological sample which is thus collected, the device being characterized in that it comprises a flask (**100**) having an open top end (**101**) sealingly capped by a first closure means (**103, 107**), a closed bottom end (**102**) capped by a bottom cap (**104**), and an outer collar (**108**) mounted about the flask (**100**) and incorporating a recessed groove (**109**) at the bottom side of the collar (**108**) to cover the edge (**110**) of the bottom cap (**104**) so as to exclude contamination from the bottom cap (**104**) when this latter is capping the bottom end (**102**) of the flask (**100**), the bottom cap (**104**) being intended to fit over the open top end (**101**) after removal of the first closure means (**103, 107**) and introduction of the biological sample into the flask (**100**).

14. A device intended to facilitate the taking of an excretal biological sample while eliminating the risks of contamination of the biological sample which is thus collected, the device being characterized in that it comprises a flask (**100**) having an open top end (**101**) sealingly closed by a first closure means (**103, 107**), a closed bottom end (**102**) capped by a bottom cap (**104**), the bottom cap (**104**) being intended to fit over the top end (**101**) after removal of the first closure means (**103, 107**) and introduction of the biological sample into the flask (**100**), and a handle (**116**) attachable to the flask, the handle (**114**) having a flat tongue (**116**) provided with a wide, longitudinally extending aperture (**118**) for preventing drops of the biological sample from reaching the fingers of a person holding the flask.

4,982,616

SAMPLING DEVICE FOR INSPECTION VEHICLES

Dieter Koch, Weyhe-Leeste, and Hans-Jakob Baum, Achim-Uesen, both of Fed. Rep. of Germany, assignors to Bruker Franzen Analytik GmbH, Fed. Rep. of Germany

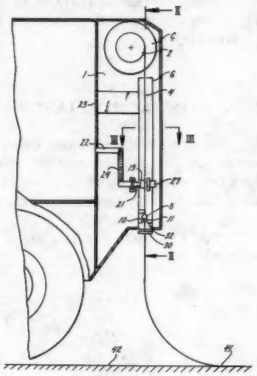
Filed Oct. 13, 1989, Ser. No. 421,260

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835207

Int. Cl.[5] G01N *1/00*

U.S. Cl. 73—864.81 10 Claims

1. In a sampling device for inspection vehicles having a movable collecting body comprising a contact surface, a receiving head of an analyzer, means for lowering and lifting the collecting body by which the contact surface of the collecting body can be moved into contact selectively with the ground carrying the vehicle and the receiving head, and means for replacing the collecting body, the improvement comprising: the said collecting body is formed by a material having a rope-like configuration (**4**) having an end section (**41**) providing a contact surface, the said means for lowering and lifting the said collecting body comprises at least two spaced, first and second guiding and feeding means (**10, 11; 2**) between which the said rope-like configured material (**4**) is held in substantially stretched condition and which enable the rope-like configured material to be displaced in longitudinal direction so as to be moved selectively into a first position in which said end section (**41**) of the material hangs down from the said first guiding and feeding means (**10, 11**) and contacts the ground (**42**) by said



contact surface, and a second position in which the contact surface of the end section, which had been in contact with the ground, is positioned opposite the said receiving head (**21**), and that the said means for changing the said collecting body comprise separating means (**30**) for cutting off the end portion (**41**) of the rope-like configured material (**4**) used last.

4,982,617

GEARSHIFT SYSTEM

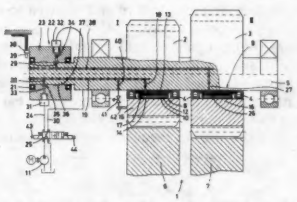
Friedrich Münker, Am Freibad 15, D-5910 Kreuztal 9, and Axel Barten, Im Gensterfeld 20, D-5900 Siegen-Sohlbach, both of Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 298,941

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805710

Int. Cl.[5] F16H *3/08;* F16D *19/00, 23/00*

U.S. Cl. 74—333 3 Claims



1. Multiple-speed transmission for rolling mill drive mechanisms, with at least two pinions of two shifting stages, rotatably supported on a motor-driven input shaft and being selectively connectible with this input shaft, for driving gear wheels non-rotationally arranged on an output shaft, characterized by selectively engageable friction clutches (**8, 9**) for coupling the drive pinions (**2, 3**) with the input shaft (**5**), wherein the friction clutches (**8, 9**) exhibit a double-walled clamping sleeve (**10**) with a jacket space (**12**) that can be connected to a pressure medium source, and with an outer jacket (**14**) radially expansible by the pressure medium in the jacket space (**12**) for frictionally clamping input shaft (**5**) and pinion or gear wheel hub (**15,**

16), and wherein the clamping sleeves (10) of the friction clutches (8, 9) are fixedly arranged on the input shaft (5) with their inner part (13) between multiple rotary bearings (4) of the drive pinions (2, 3), the clamping sleeves (10) of the friction clutches (8, 9) being connected to an oil pump (11) by way of feed ducts (17–19; 27–29) in the input shaft (5), by way of a rotationally secured hydraulic block (23), supported on the input shaft (5) by rotational bearings (21), of a rotational entering guide (22), by way of connecting conduits (24; 30) and a multiple-way valve (25).

4,982,618

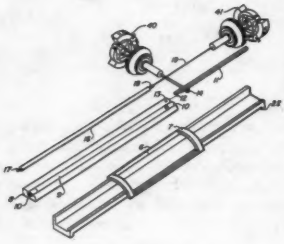
MULTIFUNCTION TACTILE MANIPULATABLE CONTROL

Craig F. Culver, 201 Ware Rd., Woodside, Calif. 94086

Continuation of Ser. No. 342,416, Apr. 24, 1989, Pat. No. 4,896,554, which is a continuation of Ser. No. 116,105, Nov. 3, 1987, Pat. No. 4,823,364. This application Dec. 20, 1989, Ser. No. 456,012

Int. Cl.[5] G09G *9/02, 1/00*

U.S. Cl. 74—471 XY 9 Claims



1. A device for generating control signals, comprising:

a support (4) having a recess (28) extending longitudinally along said support;

an elongated bar (8) movable longitudinally in said recess;

an elongated cylindrical element (16) rotatively mounted in said bar so as to move rotatively with respect to the bar and connected to the bar to move with said bar in said recess;

means (15), operable by longitudinal movement of said bar, for producing a first signal;

means (20), operable by rotational movement of said cylindrical element independent of and relative to said bar, for producing a second signal;

first means (41) coupled to said cylindrical element for imparting to said cylindrical element, in response to a given signal applied to said first means, a first selected force; and

second means (40) coupled to said movable bar (8) for imparting to said movable bar, in response to a given signal applied to the second means, a second selected force.

4,982,619

GEAR SHIFT MECHANISM FOR TILT CAB VEHICLES

Torsten Thoreson, Kungilv, Sweden, assignor to AB Volvo, Goteborg, Sweden

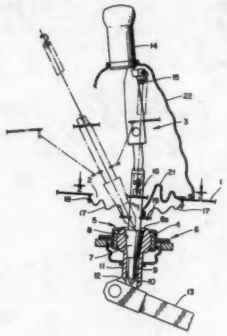
Filed May 8, 1989, Ser. No. 349,422

Claims priority, application Sweden, May 9, 1988, 8801751

Int. Cl.[5] B60K *20/04, 26/00;* B62D *33/067*

U.S. Cl. 74—473 R 8 Claims

1. A gear shift mechanism in a motor vehicle having a body and a cab tiltable relative to said body, said body including a chassis and an engine/transmission structure supported on said chassis, a shift lever mounted on said cab and including an upper manually grippable portion and a lower end projecting through a hole in a wall of said cab, a shift lever-receiving structure mounted on said body and comprising a rotatable member including a socket which is open toward said hole in said cab wall, said lower end of said shift lever being removably received in said socket of said rotary member when said cab is in a non-tilted state, said lower end of said shift lever being slidable out of said socket when said cab is in a tilted



state, and spring means operably connected to said shift lever for maintaining said lower end of said shift lever in a predetermined position relative to said socket when said cab is in said tilted state in order to facilitate reinsertion of said lower end into said socket when said cab is returned to a non-tilted state.

4,982,620

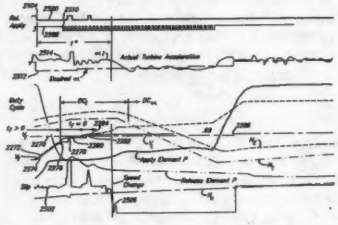
METHOD OF LEARNING FOR ADAPTIVELY CONTROLLING AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Gerald L. Holbrook, Rochester Hills; Maurice B. Leising, Clawson; Howard L. Benford, Bloomfield Hills, and Hemang S. Mehta, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 187,150, Apr. 29, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 496,114

Int. Cl.[5] F16H *47/08*

U.S. Cl. 74—731.1 6 Claims



1. In a vehicle having an engine and a transmission system including an input member, an output member, a torque converter assembly for transmitting torque between the engine and the input member, a gear assembly for changing the ratio of torque between the input member and output member, a plurality of friction elements for shifting the gear assembly, a fluid actuating device being moveable for applying at least one friction element, at least one solenoid-actuated valve being moveable in response to the presence or absence of electrical power to the valve for directing fluid flow between a fluid source and the fluid actuating device, input sensors providing input signals indicative of predetermined conditions, a controller having memory for processing and storing the input signals and predetermined values and providing output signals to

control the solenoid-actuated valves, a method of monitoring an output and adjusting the action effecting the output continuously in a vehicle transmission, said method comprising the steps of:

monitoring the speed of a turbine in a torque converter assembly;

monitoring the instantaneous fluid volume of a friction element;

setting a learned volume value equal to an instantaneous fluid volume value indicative of the instantaneous fluid volume whenever the turbine speed is within a predetermined range of a predetermined speed;

comparing the learned volume value to a stored fill volume value in memory at the end of the shift; and

adjusting the stored fill volume value based on the difference between the learned volume value and the stored fill volume value.

4,982,621

LINE PRESSURE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

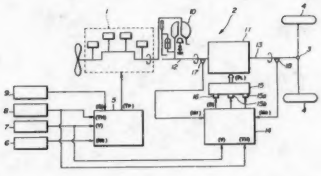
Akihiko Sano, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 6, 1989, Ser. No. 306,606

Claims priority, application Japan, Feb. 5, 1988, 63-24003

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—866 **7 Claims**



1. A line pressure control system for an automatic transmission wherein a shift between two speed ratio states involves activation of a friction device by a hydraulic fluid supplied under a line pressure, a magnitude of which is variable, and said shift begins with a command for said shift and ends with a completion of an inertia phase wherein a speed ratio of a speed of an input shaft to a speed of an output shaft varies between two speed ratio states due to activation of said friction device, said line pressure control system, comprising:

means for generating a speed ratio indicative signal indicative of said speed ratio of a speed of said input shaft to a speed of said output shaft;

means for measuring a total length of time of a shift beginning with said command for said shift and ending with completion of said inertia phase and for generating a total length of time indicative signal indicative of said measured total length of time;

means for comparing said total length of time indicative signal with a predetermined value; and

means for increasing said magnitude of said line pressure at a future time of occurrence of said shift when said total length of time indicative signal is greater than said predetermined value.

4,982,622

HYDRAULIC PRESSURE CONTROL DEVICE FOR AUTOMATIC TRANSMISSION

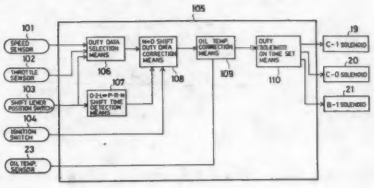
Masanari Yamamoto; Mikio Iwase, and Toshihiro Tomino, all of Anjo, Japan, assignors to Aisin Aw Co., Ltd., Japan

Filed Jul. 10, 1989, Ser. No. 377,428

Claims priority, application Japan, Jul. 12, 1988, 63-173052; Aug. 10, 1988, 63-199092

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—866 **4 Claims**



1. A hydraulic pressure control device of an automatic transmission of the type having a planetary gear mechanism, a plurality of frictional engaging elements capable of selectively connecting a plurality of rotary elements of a planetary gear mechanism, a hydraulic circuit for switching and controlling said frictional engagement device, said hydraulic circuit including a regulator valve for generating a line pressure, a manual valve for selectively changing said line pressure, a plurality of speed gear changing solenoid valves for directly controlling, through independent duty ratio control, the engaging hydraulic pressures acting on respective frictional engagement elements, and a plurality of relay valves controlled by said solenoid valves, said hydraulic pressure control device comprising: a shift lever position switch for detecting in which one of D, 2, L, P, R and N ranges the shift lever is set; a shift time detection means for detecting, in response to the signal from said shift lever position switch, the time from the moment of shift from D, 2 or L range to P, R or N range till the moment of shift back to D, 2 or L range from said P, R or N range; and correction means for correcting the duty data concerning the duty ratio of current supplied to said solenoid valve at the time of shifting from P, R or N rang to said D, 2 or L range in accordance with the signal from said shift time detection means.

4,982,623

METHOD OF CONTROLLING THE AUTOMATIC TRANSMISSION OF A VEHICLE

Toshihiko Yoshino; Koichi Funatsu, and Keiichi Ishikawa, all of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1989, Ser. No. 426,603

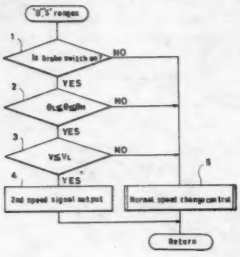
Claims priority, application Japan, Oct. 31, 1988, 63-273204

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **2 Claims**

1. A method of controlling an automatic transmission for a vehicle comprising the steps of:

changing an automatic speed change according to a travelling condition of the vehicle; and



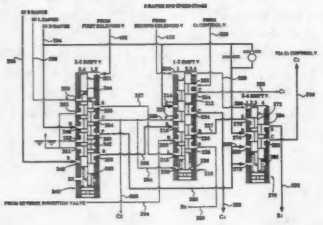
up-shifting the automatic transmission when a brake device and an acceleration pedal have been operated when a vehicle speed is less than a predetermined value.

4,982,624

HYDRAULIC CONTROL DEVICE FOR AUTOMATIC TRANSMISSION FOR VEHICLE HAVING FRICTION ENGAGING MEANS OPERATIVE IN TWO JUMPING APART SPEED STAGES

Mitsuru Takada; Hiroshi Itoh, both of Toyota; Tokuyuki Takahashi, Aichi, and Makoto Funahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 2, 1989, Ser. No. 388,612
Claims priority, application Japan, Aug. 2, 1988, 63-192965; Nov. 2, 1988, 63-278346
Int. Cl.[5] B60K *41/22, 41/24*; F16H *59/70*
U.S. Cl. 74—869 **3 Claims**



1. A hydraulic control device for an automatic transmission for a vehicle such as an automobile, wherein said automatic transmission has a first friction engaging means adapted to be engaged or disengaged for switching over speed stages between a certain speed stage and a speed stage on a higher side of said certain speed stage, and a second friction engaging means adapted to be engaged for providing a speed stage on a higher side of said certain speed stage under a certain manual shift range and to be engaged for providing a speed stage on a lower side of said certain speed stage under another manual shift range different from said certain manual shift range, comprising:

a first shift valve for controlling supply and exhaust of a hydraulic pressure to and from said first friction engaging means for switching over speed stages between said certain speed stage and said speed stage on a higher side of said certain speed stage and for controlling supply and exhaust of a hydraulic pressure to and from said second friction engaging means, said first shift valve having a drain port for exhausting a hydraulic pressure from said second friction engaging means, and

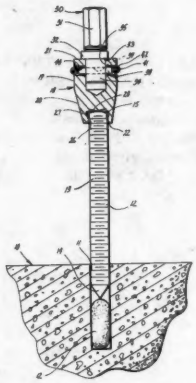
a second shift valve adapted to be shifted between shift positions for switching over speed stages between said certain speed stage and said speed stage on a lower side of said certain speed stage and adapted to be supplied with a hydraulic pressure from a manual shift valve under said another manual shift range, said second shift valve transmitting said hydraulic pressure from said manual shift valve to said drain port of said first shift valve for said second friction engaging means when said second shift valve is shifted to a position thereof for setting up said speed stage on the lower side of said certain speed stage.

4,982,625

ADAPTOR AND DRIVER FOR AN ADHESIVE CAPSULE ANCHOR

Ben V. Bonner, Bloomfield Hills, Mich., assignor to A.T. & G. Company, Inc., Farmington Hills, Mich.

Filed Nov. 10, 1986, Ser. No. 928,864
Int. Cl.[5] B25B *13/50*
U.S. Cl. 81—53.2 **2 Claims**



1. An adaptor and driver unit for a threaded anchor that is to be rotatably driven into a breakable capsule, carrying a chemical adhesive disposed in a hole in concrete, masonry, rock or the like, comprising:

(a) a driver having a body with a threaded hole in a lower end thereof and an adaptor connector shaft hole in an upper end thereof, and which threaded hole terminates with an inner end wall, and the inner end of the threaded hole communicates with an undercut groove of a diameter larger than the diameter of said threaded hole;

(b) the threaded hole inner end wall being formed with a conical axial end surface for abutting engagement with the outer end of a threaded anchor which is threaded into said threaded hole;

(c) an adaptor having a drive shaft seated in the connector shaft hole in the driver body;

(d) attachment means for releasably securing the adaptor connector shaft to said driver body;

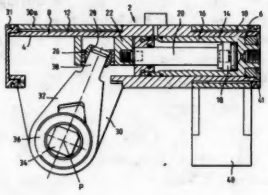
(e) said attachment means including a retainer pin operatively mounted in a transverse hole formed through the driver body and an aligned transverse hole formed through the adaptor connector shaft; and,

(f) means for releasably holding said retainer pin in said transverse holes.

4,982,626
HYDRAULIC TORQUE WRENCH

Nicholas More, Felton; Ian C. Thompson, Cramlington, and John N. Walton, Whitley Bay, all of England, assignors to Hedley Purvis Limited, Morpeth, England

Filed Feb. 7, 1990, Ser. No. 476,324
Claims priority, application United Kingdom, Feb. 7, 1989, 8902659
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—57.39 8 Claims



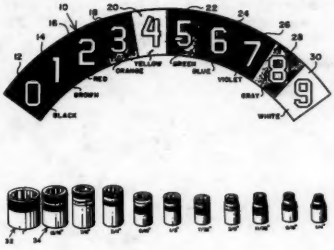
1. A hydraulic torque wrench comprising:
a body member,
a hydraulic piston-cylinder assembly having a piston capable of linear reciprocation within the body member, said piston having a free end and a line of action,
a drive member rotable relative to said piston-cylinder assembly having an axis of rotation radially spaced from the line of action of the piston,
holding means carried by the drive member,
a rachet connection between the drive member and the holding means, said ratchet connection being centered on said axis of rotation, and
a spherical bearing member mounted to the free end of the piston capable of undergoing guided linear reciprocal movement with the piston within the body member,
the bearing member including means for defining therein a bore, the drive member including a neck portion at an end radially remote from said axis of rotation, said neck portion being slidably received within the bore in said spherical bearing member, the arrangement being such that, as the drive member is rotated by linear movement of the piston and attached spherical bearing member, the neck portion of the drive member undergoes guided sliding movement in the bore of the bearing member, which bearing member rotates relative to the piston, thereby causing the perpendicular distance between the line of action of the piston and said axis of rotation to remain constant.

4,982,627
COLOR CODED TOOLS

Ken A. Johnson, 6574 NW. Third St., Margate, Fla. 33063

Filed Dec. 18, 1985, Ser. No. 810,223
Int. Cl.[5] B25B *13/06*
U.S. Cl. 81—121.1 32 Claims
(2 of 2 Drawing(s) in Color)

1. A color coded tool size identification system comprising:
at least one groove formed on the surface of a tool, each said groove being of a predetermined configuration of width to distinguish English from metric sizes;
a colored material disposed within the groove to form a color ring, said colored material recessed beneath the tool surface and indicating a size numeral;
a chart defining all ten arabic numerals as indicated by various colors, resulting in infinite size combinations by using as many grooves and colors disposed therein as necessary to define any size; and

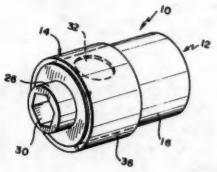


particular spacing to define a dividing line between a numerator and denominator of a fraction.

4,982,628
LUG NUT STORAGE ATTACHMENT FOR A POWER DRIVEN LUG NUT REMOVER

Mario P. DiForte, 3510 N. Wind Rd., P.O. Box 8537, Baltimore, Md. 21234

Filed Jul. 25, 1989, Ser. No. 384,433
Int. Cl.[5] B25B *13/02*
U.S. Cl. 81—125 18 Claims



1. A lug nut storage attachment for a power driven lug nut remover having a rotatable shaft, said attachment including:
(a) a first member concentrically mounted on said shaft and rotatable therewith;
(b) said first member having a chamber for storing lug nuts;
(c) a portion of said first member being adapted for engagement with a lug nut and provided with a passageway to carry the lug nut to the storage chamber;
(d) said first member having an opening in communication with the storage chamber to permit removal of lug nuts therefrom;
(e) a second member concentrically mounted on, and in sleeved engagement throughout its length with a portion of the outer surface of said first member; and
(f) said second member being slidable on the outer surface of said first member to a first position to cover the first member opening during operation of the lug nut remover, and to expose this opening when slid to a second position to permit removal of lug nuts from the storage chambers of the first member.

4,982,629

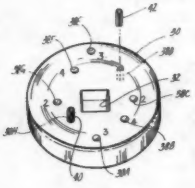
TOOL AND METHOD FOR REMOVING THE CAP OF AN OIL FILTER CARTRIDGE

Ronald T. Germain, 1429 Philmore, Lincoln Park, Mich. 48146

Continuation of Ser. No. 65,044, Jun. 22, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 233,288

Int. Cl.[5] B25B *13/00*

U.S. Cl. 81—176.1 **4 Claims**



1. For use with an engine having a threaded lubrication fitting and a filter cartridge having a cap with a threaded element having a central opening threadably engaged with the threaded fitting of the engine, the cap having a pair of spaced, existing, oil-passing openings disposed about the threaded element, the cartridge having a case at least partially removed to permit access to said oil-passing openings from the interior of the case;

a tool for removing the case from the lubrication fitting, said tool comprising:

a body receivable in the partially removed cartridge and the body having a plurality of radially spaced openings at varying diameters from the central opening, the body having a central opening for receiving the shank of a wrench for turning the body; and

at least a pair of pins removably received in the pin-receiving openings of the body in positions in which a portion of each pin extends beyond the body and is received in an oil-passing opening in the cartridge cap,

whereby the pins connect the body to the cap for turning both the cap and the body with the wrench to disengage the threaded element from the threaded fitting.

4,982,630

PLIERS-TYPE TOOL

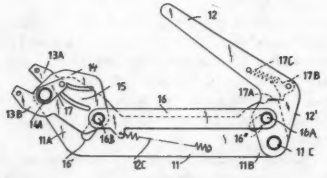
Hartmut Schmode, Blomberg; Ulrich Wiebe, Dörentrup, both of Fed. Rep. of Germany, and Hans Undin, Akersberga, Sweden, assignors to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Nov. 9, 1989, Ser. No. 433,479

Claims priority, application Sweden, Nov. 11, 1988, 8804083

Int. Cl.[5] B25B *7/12*

U.S. Cl. 81—352 **9 Claims**



1. A pliers-type tool comprising:

a longitudinal tool body having a first end and a second end, an operative part being provided at said first end of said tool body for the treatment of a work piece, said operative part comprising a fixed first jaw carrier means and a movable second jaw carrier means, an operating lever pivotably attached to said second end of the tool body, driving rod means having a first end and a second end and pivotably attached at its first end to the second jaw carrier means, and at its said second end to said operating lever means so as to be affected thereby, the second jaw carrier means being arranged on a pivotable rocker means which with the aid of a pivot pin is rotatably mounted on the tool body and is rigidly connected with at least one bracket which is resiliently bendable in the plane of the rocker means, said bracket having a free end to which a first end of a link is connected, the pivot pin being attached to a second end of said link and passing through the rocker member in a hole which is larger than the diameter of the pivot pin, so that the mutual position of the rocker and its pivot pin is variable to the extent permitted by the resiliency of said bracket.

4,982,631

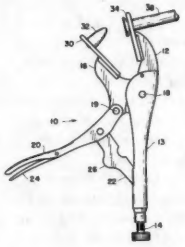
MECHANIC'S TUBING PLUG

John K. Lowther, 5780 Barrett Rd., Colorado Springs, Colo. 80926

Filed May 21, 1990, Ser. No. 525,693

Int. Cl.[5] B25B *7/02*

U.S. Cl. 81—426 **5 Claims**



1. A mechanic's tool for temporarily sealing the end of a tube having a flared end, said tool comprising:

a pliers having first and second jaws, each jaw coupled to a jaw controlling handle;

locking means included in said pliers for locking said first and second jaws in a closed position;

clamping means attached to said first jaw for securing the end portion of a tubing with the flared end of said tubing generally aligned toward said second jaw; and

a conical resilient plug attached to said second jaw; said plug having its apex generally pointing toward said clamping means.

4,982,632

SOCKET WRENCH SET

Thomas C. Barmore, 4 N 127 Verrill, Addison, Ill. 60101

Filed May 12, 1986, Ser. No. 861,991

Int. Cl.[5] B25B *23/00*

U.S. Cl. 81—438 **8 Claims**

1. A socket wrench unit comprising,

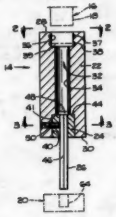
a socket having a rear end and a front end, and a longitudinal hole therethrough from end to end and having means at the rear end for mounting the socket on a drive tool,

said hole having a rearward facing shoulder,

an inner drive element in said hole having a head engaging said shoulder and extending forwardly through said hole, and

stopper means separate from the socket and the inner drive element operable for retaining the inner drive element

against falling through the hole rearwardly, the stopper means being held in place in the hole by friction, and



removable by imposing abnormal force rearwardly on the inner drive element.

4,982,633

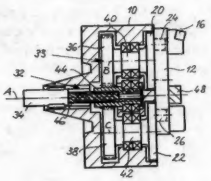
FACING HEAD WITH MASS BALANCING

Herbert Jager, Sinsheim, Fed. Rep. of Germany, assignor to GTE Valenite Corporation, Troy, Mich.

Filed Dec. 14, 1989, Ser. No. 450,708

Int. Cl.[5] B23B *29/34*

U.S. Cl. 82—123 **13 Claims**



1. A facing head for a machine tool, comprising:

(a) a base body;

(b) a tool spindle having an axis of rotation, said body being rotatable with the tool spindle about the tool spindle axis;

(c) two slides of which at least one carries a tool, said slides arranged adjacent each to other in the base body in a radial plane perpendicular to the tool spindle axis;

(d) an actuator which serves for tool adjustment and which moves the two slides for active force balancing simultaneously and in opposite directions to each other; and

(e) a parallel crank mechanism having two double armed cranks which are each rotatable by the actuator about an axis to describe a circular path, said cranks connected to the slides by crank pins and engage the slides so that the slides are formed as connecting links between the double armed cranks and the parallel crank mechanism and each point of the slides describe a part of the circular path.

4,982,634

MULTIPLE-SPINDLE AUTOMATIC LATHE

Peter Nagel, Schulstrasse 14, D-5780 Bestwig-Ramsbeck, and Franz Schmid, Erlenweg 27, D-7411 St. Johann, both of Fed. Rep. of Germany

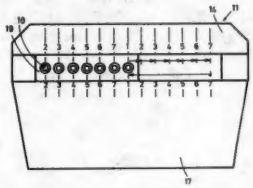
Filed Oct. 24, 1988, Ser. No. 261,544

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735926; Oct. 10, 1988, 3834382

Int. Cl.[5] B23B *3/34*

U.S. Cl. 82—129 **3 Claims**

1. A multiple-spindle automatic lathe for the production of workpieces in successive tool stations with work spindles (10) and tool stations shiftable cyclically with respect to one another, the work spindles and tool stations being disposed in rectilinear arrays parallel to each other, the number of work spindles being neither more nor less than n and the number of tool stations being neither more nor less than $2n-1$, the tool stations being disposed in the sequence 2 to n followed by 1 to n, whereby each workpiece, after each machining operation in a tool station, may be shifted cyclically in a linear fashion



relative to a subsequent station and, after $n-1$ conveying steps and a subsequent return stroke, or a return stroke between two conveying steps, may return to an initial machining station, and loading and unloading means for workpieces at at least one tool station.

4,982,635

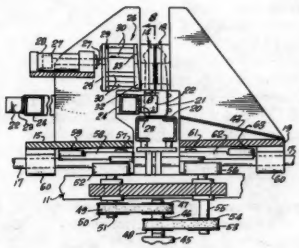
VERTICAL DEFLASHING MACHINE

Alan J. Thatcher, 9182 E. Russell St., La Habra, Calif. 90631

Filed Jun. 13, 1988, Ser. No. 205,863

Int. Cl.[5] B26D *5/04*

U.S. Cl. 83—149 **10 Claims**



1. A vertical deflashing machine for removing the flashing from blow molded, plastic objects such as containers, said machine comprising:

a frame having a generally horizontal conveying surface held thereon, said conveying surface having a first side and a second side;

an object to be deflashed, said object being carried on said conveying surface, and said object having a first side and a second side;

a first deflashing nest supported by said frame and positioned on the first side of said conveying surface;

a second deflashing nest supported by said frame and positioned on the second side of said conveying surface;

a horizontally, movable, deflashing tooling cutting plate supported by said frame on the first side of said conveyor belt;

means for moving said first and second deflashing nest inwardly at the same time toward said object to be deflashed, said means comprising first and second pulleys on a driven shaft, said first pulley having belt means thereon which drives a first driven pulley and said second pulley having belt means thereon which drives a second driven pulley, and said first and second pulleys are interconnected with said first and second deflashing nest to cause them to move inwardly and outwardly; and

means for moving said tooling cutting plate toward said object to be deflashed, said means for moving said tooling cutting plate being independently actuated from said means for moving said first and second deflashing nests.

4,982,636

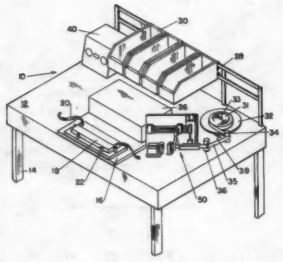
MEASURED LEADER LENGTH SUPPLY SYSTEM

Paul E. Becking, P.O. Box 3200, Monterey, Calif. 93940

Filed Mar. 17, 1989, Ser. No. 324,941

Int. Cl.[5] B26D *7/02*

U.S. Cl. 83—167 **24 Claims**



16. Apparatus for severing measured lengths of ribbon from a supply of ribbon:

a support plate;

a supply of ribbon on said support plate, said ribbon having a leading end;

an accumulator on said support plate for retaining a length of said ribbon;

a gripper supported above said support plate for grasping said leading end of ribbon;

means for transporting said gripper in the horizontal and vertical directions and for drawing said leading end of ribbon into and through said accumulator;

a roller assembly on said support plate adjacent said accumulator for stuffing a length of said ribbon into said accumulator;

a stepping motor coupled to said roller assembly for rotating said roller assembly a predetermined number of revolutions so as to stuff a measured length of said ribbon into said accumulator;

means on said base for clamping said ribbon;

means forming a part of said clamping means for severing said measured length from said ribbon when said ribbon is clamped.

4,982,637

ROTARY CUTTING APPARATUS

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 248,283, Sep. 22, 1988, Pat. No. 4,914,995, and Ser. No. 245,595, Sep. 16, 1988, Pat. No. 4,923,013, which is a division of Ser. No. 38,079, Apr. 14, 1987, abandoned, said Ser. No. 248,283, is a continuation of Ser. No. 38,079, Apr. 14, 1987, abandoned. This application Oct. 11, 1989, Ser. No. 419,876

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] B26D *1/62*

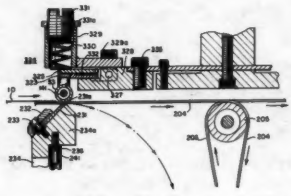
U.S. Cl. 83—346 **9 Claims**

1. Apparatus for cutting a moving plastic film web at predetermined location:

a die having a cutting surface;

means supporting said die for rotating said cutting surface along a circular arc; and

roller means positioned at a stationary location along the circular arc for cyclicly contacting and rolling across the cutting surface for cutting the plastic film web passing between said roller means and said cutting surface at the predetermined locations in the web, said roller means comprising a roller mounted on a support member by an assembly including a bracket mounting a shaft supporting said roller, said bracket being attached to one end of a rocker arm in depending relation and the other end of the rocker arm being pivotably carried by said support member, a housing for a loading spring carried by said support member adjacent said one end of said rocker arm and above said roller, said housing having a tubular opening



therethrough having an axis extending transversely to the axis of said shaft supporting said roller, a helical loading spring disposed within said tubular opening of said housing and having one end engaging said rocker arm at said one end thereof to apply a load pressure to said roller, spring adjusting screw means threadedly carried in one end of the tubular opening in said housing for engaging the opposite end of the helical spring to adjust the load pressure of said spring applied to said roller, and stop means carried by said support member to limit the movement of the roller in the direction of said cutting surface.

4,982,638

PNEUMATICALLY OPERATED CUTTING DEVICE

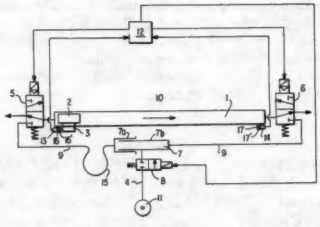
Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft Mit Beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,008

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805164

Int. Cl.[5] B26D *5/12*

U.S. Cl. 83—614 **11 Claims**



1. A cutting device for severing sheet material comprising:

(a) a pneumatic cylinder defining a cylinder chamber having opposite first and second ends;

(b) a piston longitudinally slidably received in the cylinder chamber for executing working strokes between the first and second ends; said piston dividing said cylinder chamber into a first chamber part containing said first end and a second chamber part containing said second end;

(c) a cutting blade situated at least partially externally of the

cylinder and being secured to the piston for travel with the piston as a unit;

(d) a pressurized air vessel means for storing pressurized air therein;

(e) a first and a second switching valve connected to said cylinder chamber at said first and second end, respectively, and to said pressurized air vessel means; said first and second switching valve each having a first position in which pneumatic communication is maintained between the pressurized air vessel means and a respective said cylinder chamber part and a second position in which the respective cylinder chamber part is vented;

(f) recharging means for recharging said pressurized air vessel means with pressurized air to a predetermined pressure solely prior to each working stroke of the piston and for allowing the pressure to diminish in said pressurized air vessel means during each working stroke of the piston to a point of substantial exhaustion of the energy derived from the pressurized air for driving the piston to execute each working stroke; and

(g) means for coordinating operations of said first and second switching valves and said recharging means.

4,982,639

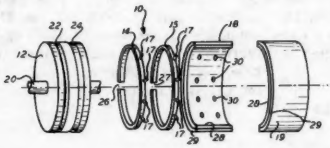
DIE CUTTING ANVIL SYSTEM

Alan D. Kirkpatrick, Martinsville, N.J., assignor to Robud Company, Pine Brook, N.J.

Continuation of Ser. No. 264,458, Oct. 31, 1988, abandoned. This application Dec. 26, 1989, Ser. No. 456,582

Int. Cl.[5] B26D *7/20*

U.S. Cl. 83—659 **11 Claims**



1. A rotary anvil comprising:

an anvil head suitable for mounting on a rotatable shaft and having a peripheral surface;

a laminated cover having inside and outside superimposed layers bonded to each other over a major portion of their adjacent surfaces;

said inside layer being made of a relatively hard, resilient material;

said outside layer being made of a relatively soft, resilient material; and

means for coupling said cover to an anvil, said means including a plurality of spaced holes formed in said inside layer, said holes for receiving pins which cooperate with said holes for coupling said cover to said anvil, said means for coupling causes said cover to be slidably secured for longitudinal and transverse movement with respect to said anvil head.

4,982,640

GUITAR WITH IMPROVED RELEASABLE NECK JOINT CONSTRUCTION

John R. Buscarino, 8460 81st Way North, Seminole, Fla. 34647

Filed Sep. 19, 1989, Ser. No. 409,083

Int. Cl.[5] G10D *3/00*

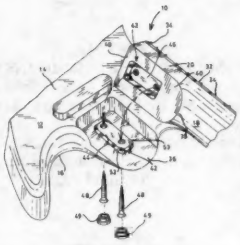
U.S. Cl. 84—293 **12 Claims**

1. A guitar with improved releasable neck joint construction, said guitar comprising:

a body having a forwardly facing neck engaging surface;

a neck having a forwardly facing finger board surface and defining a longitudinal axis extending from a distal end portion to a proximal end portion, said proximal end portion of said neck defining a rearwardly facing body engaging surface for engaging said neck engaging surface of said body; and

securing means for securing said proximal end portion of said neck to said body, said securing means including at least one mortise/tenon coupling disposed at the junction of said neck engaging surface and said body engaging



surface, said coupling including a tenon defining a sidewall perimeter, and said coupling being provide with a mortise defining a tenon engaging closed sidewall perimeter for substantially flush engagement with and about said outer sidewall perimeter of said tenon whereby said substantially flush engagement between said mortise and tenon prohibits both lateral and longitudinal movement of said neck with respect to said body.

4,982,641

GUITAR PICK HOLDER

Dean K. Duhart, P.O. Box 298, St. Ann, Mo. 63074

Filed Jan. 8, 1990, Ser. No. 462,062

Int. Cl.[5] G10D *3/16*

U.S. Cl. 84—329 **13 Claims**

1. A guitar pick holder comprising a band made of absorbent material such as terry cloth o r the like removeably fitted around the arm of a guitar player generally at the write, a tether line having a first end and a second end opposite said first end, the tether line being connected to the band at said first end thereof and extending generally downwardly from the band, the length of the tether line extending generally downwardly from the band substantially corresponding to the distance from the wrist to the fingertips of the guitar player, and means at the second end of the tether line for connecting a guitar pick to the tether line.

6. A guitar pick holder in combination with a guitar pick comprising a band removeably fitted around the arm of a guitar player generally at the writs, a tether line having a first end and a second end opposite said first end, the tether line being connected to the band at said first end thereof and extending generally downwardly from the band, the length of the tether line extending generally downwardly from the band substantially corresponding to the distance from the wrist to the fingertips of the guitar player, the guitar pick including a

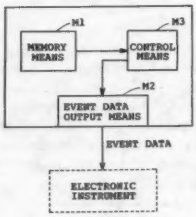
generally triangular portion having a gripping surface on either face thereof and a boss projecting outwardly from the generally triangular portion, the boss having an opening therein for connection of the second end of the tether line to the pick whereby connection of the pick to the tether line does not reduce the available area on said gripping surfaces for gripping the pick.

4,982,642

METRONOME FOR ELECTRONIC INSTRUMENTS

Hiroshi Nishikawa, Nagoya, and Akinari Inoue, Kasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 15, 1990, Ser. No. 523,356
Claims priority, application Japan, May 26, 1989, 1-134347
Int. Cl.[5] G09B *15/00*
U.S. Cl. 84—484 20 Claims



11. A data output device for outputting code data to an electronic instrument that generates sound under control of code data, comprising:

setting means for setting conditions of the beat sound, where the conditions of the beat sound are stored in the memory means as tempo data representing a speed and beat data representing a beat of the piece of music.

memory means for storing at least the tempo data and beat data;

event data output means; and

control means for instructing the event data output means to output code data corresponding to the beat data at time intervals corresponding to the tempo data to the electronic instrument such that the electronic instrument generates at least a beat sound for a predetermined time period at pitches and volumes corresponding to the beat data and at time intervals corresponding to the tempo data.

4,982,643

AUTOMATIC COMPOSER

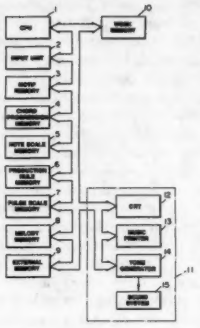
Junichi Minamitaka, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 288,001, Dec. 20, 1988, abandoned.
This application Mar. 13, 1990, Ser. No. 494,919
Claims priority, application Japan, Dec. 24, 1987, 62-325176; Dec. 24, 1987, 62-325177; Dec. 24, 1987, 62-325178
Int. Cl.[5] G10H *1/38, 7/00*
U.S. Cl. 84—613 20 Claims

13. An apparatus for analyzing a chord progression formed by a succession of chords, comprising:

chord progression providing means for providing a chord progression formed by a succession of chords having associated time intervals; and

key determining means responsive to said chord progression providing means for automatically and variably determining from said chord progression a key for each time inter-



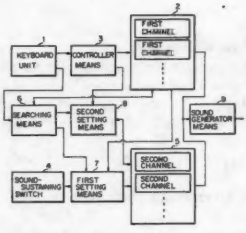
val of a chord in said chord progression to provide a key structure in music as a function of said chord progression.

4,982,644

ELECTRONIC MUSICAL INSTRUMENT WITH TONE-SUSTAINING CONTROLLER

Takeo Shibukawa, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 149,685, Jan. 19, 1988, Pat. No. 4,858,508. This application Jun. 28, 1989, Ser. No. 372,475
Claims priority, application Japan, Jan. 29, 1987, 62-19081
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] G10H *7/00, 1/02*
U.S. Cl. 84—627 2 Claims



1. An electronic musical instrument for electronically producing sounds, comprising:

(a) a keyboard having a plurality of keys for producing note information representative of a note of a depressed state key;

(b) first memory means provided with a plurality of first channels each capable of storing said note information;

(c) controller means operative to assign said note information to one of said first channels, said one of said first channels being available to said note information upon assignment;

(d) a sostenuto switch operated by an operator for producing switch state information alternatively representing an activated state and an inactivated state;

(e) second memory means provided with a plurality of second channels for storing sostenuto information alternatively representing a first state and a second state, said first state being representative of a request for imparting a sostenuto effect to a sound produced in accordance with

said note information, said second state being representative of the absence of said request;

(f) searching means operative to search, when a key is depressed, said first memory means for a first channel which has already stored note information identical with said note information of said depressed key;

(g) first setting means operative to set to said first state said sostenuto information stored in one of said second channels corresponding to said first channel supplied with said note information when said switch state information is in said activated state, said first setting means further being operative to set to said second state said sostenuto information stored in said one of said second channels when said switch state information is in said inactivated state;

(h) second setting means responsive to said searching means to set said sostenuto information stored in said one of said second channels to the same state as said sostenuto information stored in a second channel corresponding to said first channel which has already stored said note information; and

(i) sound generator means operative to produce one of said sounds having the note specified by said note information, said sound generator means further operative to impart said sostenuto effect to said one of said sounds when said sostenuto information stored in said one of said second channels is in the first state.

4,982,645

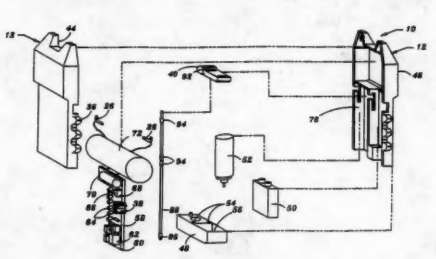
IRRITANT EJECTING STUN GUN

Joseph G. Abboud, 13628 Grover St., Omaha, Nebr. 68144

Filed Jan. 23, 1990, Ser. No. 469,035

Int. Cl.[5] F41A *35/00;* **F41B** *15/00;* **F41C** *27/00*

U.S. Cl. 89—1.11 **6 Claims**



1. An irritant fluid ejecting electrical stun gun, comprising,

a housing having top and bottom ends and opposite side edges,

a pair of electrically conductive test probes protruding from said housing at spaced apart positions,

electrical circuit means in said housing including connector means for connecting said circuit means to an electrical power source, means electrically interposed between said connector means and said test probes for substantially increasing the voltage of current from a power source and a manually operable switch means operative to selectively make and break the electrical connection between at least one of said test probes and said means for increasing voltage whereby a high voltage potential is created between said probes upon closing of said switch means,

said housing including a recess for removably receiving and storing a replaceable pressurized irritant fluid canister,

said housing including an opening through which irritant fluid may be ejected from a canister in said recess,

second switch means on said housing and movable between on and off positions, and

said recess, opening and second switch means being positioned on said housing and operatively associated with one another such that upon placement of an irritant fluid canister in said recess and upon movement of said second switch means from the off to the on position, irritant fluid is ejected from said canister into and through said opening.

4,982,646

BARRELED WEAPON

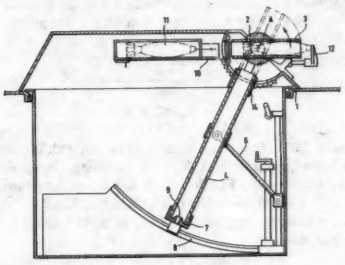
Wilhelm Machmer, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 15, 1990, Ser. No. 523,719

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1989, 3919151

Int. Cl.[5] F41F *1/06, 23/06*

U.S. Cl. 89—1.35 **7 Claims**



1. A barreled weapon including a forward barrel segment; actuating means for tilting said forward barrel segment about a trunnion; a rear barrel segment which is pivotable about said trunnion; a sealing ring for sealing a separating location between said barrel segments in the coaxial position of said segments in the absence of an axial displacement of any of said barrel segments; a casing member having a screwthread formed thereon, said actuating means rotating said casing in the coaxial position of said barrel segments whereby said casing in conjunction with the sealing ring arranged thereon axially slides over said separating location between said barrel segments.

4,982,647

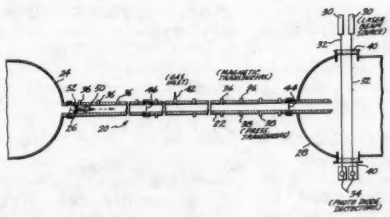
METHOD AND APPARATUS FOR INITATING STABLE OPERATION OF A RAM ACCELERATOR

Abraham Hertzberg, Bellevue; Adam P. Bruckner, Seattle, both of Wash.; David W. Bogdanoff, Mountain View, Calif., and Carl Knowlen, Seattle, Wash., assignors to Washington Research Foundation, Seattle, Wash.

Filed Jun. 16, 1988, Ser. No. 207,706

Int. Cl.[5] F41F *1/00*

U.S. Cl. 89—8 **30 Claims**



1. In a ram accelerator, including a projectile having an aft portion and a linearly extending tube having a bore, at least a portion of which is filled with a combustible mixture of a

gaseous fuel and an oxidizer, apparatus for preaccelerating the projectile, and for initiating a stable combustion zone behind the projectile, comprising:

force generating means for providing a force acting on the aft portion of the projectile so as to accelerate it to supersonic velocity, propelling it into the portion of the tube filled with the combustible mixture; and throttling means that are independent of the projectile and its profile, for controlling the velocity of a shock wave generated at the aft portion of the projectile as the projectile enters the combustible mixture by controlling the dynamic impulse pressure immediately behind the projectile so that the shock wave does not propagate ahead of it, said throttling means causing the shock wave to instead attach to the projectile, thereby establishing a stable subsonic combustion zone along the aft portion of the projectile in which combustion of the gaseous fuel continues to accelerate the projectile down the bore of the tube.

4,982,648

GUN BARREL COOLING ARRANGEMENT

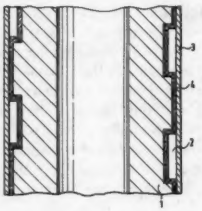
Johannes Bol, Heppenheim, and Manfred Schildknecht, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,246

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639866

Int. Cl.[5] F41A *21/44, 21.02*

U.S. Cl. 89—14.1 **19 Claims**



1. An arrangement for cooling a gun barrel, comprising:

a gun barrel having an outer surface; means for forming a plurality of cooling channels which extend helically around said outer surface of said gun barrel for the passage of a cooling fluid through said channel; and a layer of thermal insulation material disposed on and circumferentially extending around said outer surface of said gun barrel, with said layer being disposed at least on an inner circumferential surface of each of said cooling channels.

4,982,649

STRAIGHT-ACTION BREECH BLOCK SYSTEM

Richard Koine, Ratingen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 18, 1989, Ser. No. 423,045

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1988, 3835556

Int. Cl.[5] F41A *19/61*

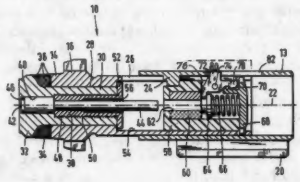
U.S. Cl. 89—28.05 **15 Claims**

1. In a tubular automatic weapon including a barrel having a rear terminal portion defining a chamber, and a breech block having a breech block axis and being arranged for movement in axial alignment with the barrel; said breech block having a housing and a head; said housing having a forward and a rearward position relative to the head; the improvement wherein said breech block further comprises

(a) an iron core secured within said head;

(b) a permanent magnet situated within the head and being movable relative to the iron core in inductive relationship therewith;

(c) energy accumulating means for storing the kinetic energy derived from the motion of the housing towards said rearward position; and



(d) coupling means for connecting said energy accumulating means with said permanent magnet to cause the permanent magnet to be propelled forwardly relative to said iron core by the energy released by said energy accumulating means, thereby generating a magnetic field for inducing an igniting current in a cartridge situated in said chamber.

4,982,650

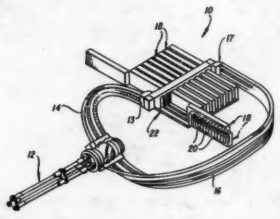
MODULAR AMMUNITION PACKAGING AND FEED SYSTEM

Joseph F. Bender-Zanoni; Howard T. Cook, Jr., both of Grand Isle; Thomas W. Cozzy, Burlington, all of Vt., and Stephen A. Jarvis, Mesa, Ariz., assignors to General Electric Company, Burlington, Vt.

Filed Oct. 16, 1989, Ser. No. 422,711

Int. Cl.[5] F41A *9/04*

U.S. Cl. 89—34 **20 Claims**



4. A modular ammunition packaging and feed system for a rapid-fire gun comprising, in combination:

A. a support frame having

(1) a plurality of side-by-side load positions, and

(2) a drive mechanism including a separate power takeoff site aligned with each said load position;

B. a magazine having an exit and including a plurality of modular magazine packs, each said magazine pack having

(1) a case,

(2) an endless loop conveyor mounted within said case and having a plurality of carriers distributed along the conveyor length for individually accommodating a round of ammunition for conveyance, and

(3) a drive element drivingly connected with said loop conveyor and driving connectable with said drive mechanism at said power takeoff site aligned with one of said load positions in which said magazine pack is disposed; and

C. guide means positioned to transfer ammunition rounds between said loop conveyors of adjacent said magazine packs along a serpentine path ending at said magazine exit

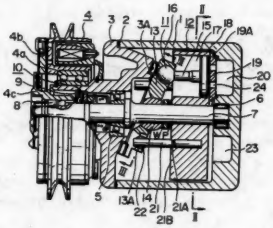
when said drive elements are driven in unison by said drive mechanism.

4,982,651

COMPRESSOR FOR COMPRESSING GASES

Hisanobu Kanamaru, Katsuta, and Kenichi Gunji, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

Filed Jun. 8, 1988, Ser. No. 203,930
Claims priority, application Japan, Jun. 10, 1987, 62-143162
Int. Cl.[5] F04B *1/20*
U.S. Cl. 91—499 **10 Claims**



1. In a gas compressor comprising a rotational shaft journaled by a stationary part, a cylinder block arranged in a fixed relationship with said rotational shaft for rotation with the shaft and formed with a plurality of through holes defining therein working fluid chambers, and piston driving means including a wobble plate arranged in an inclined manner to oppose one end surface of said cylinder block and rotatably holding one ends of said pistons, the compressor being constructed such that, when said cylinder block is rotated together with said rotational shaft, a fluid is sucked from a low pressure passage into said working fluid chambers and is discharged therefrom into a high pressure passage, the improvement wherein:

said wobble plate is supported on said rotational shaft for rotation with said shaft and for wobbling movement, and said piston driving means further includes only two driving pins having one end portions secured to said cylinder block for fixedly holding the pins so they extend parallel with said rotational shaft, said driving pins having the other end portions slidably engaging said wobble plate through spherical bearings.

4,982,652

FLUID OPERATED ACTUATOR WITH RECESSED POSITION SENSOR AND RECESSED END CAP FASTENER

John A. Blatt, 22 Stratton Pl., Grosse Pointe Shores, Mich. 48236

Filed May 19, 1989, Ser. No. 353,965
Int. Cl.[5] F01B *25/26, 31/12*
U.S. Cl. 92—5 R **13 Claims**

1. A fluid operated actuator comprising:

a housing member having a longitudinally extending aperture with open ends;

first and second end caps for attachment to opposite ends of the housing forming a chamber within the housing;

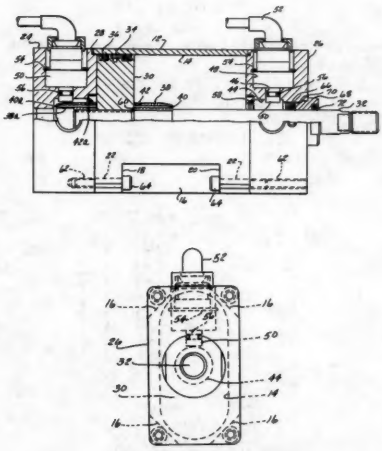
means for sealingly connecting the first and second end caps to the housing;

a longitudinally reciprocal piston member and attached rod disposed within the chamber with the rod extending externally of the chamber through one of the end caps, the piston member adapted for reciprocal movement from one end limit of travel to a second end limit of travel;

at least one of the first and second end caps having a longitudinal aperture in communication with the chamber and a transverse aperture communicating between the longitudinal aperture and an exterior of the end cap, the transverse aperture including an enlarged portion adjacent the exterior of the end cap;

enlarged shoulder means carried by the rod adjacent the piston member and engageable within the longitudinal aperture of the end cap when the piston member is in one of the end limits of travel;

sensor means sealingly engaged within the transverse aperture of the end cap for sensing the piston member in the



end limit of travel, wherein a substantial portion of the sensor means is received within the enlarged portion of the transverse aperture such that an exterior end of the sensor means is generally flush with the exterior of the end cap providing a low profile between the end cap and the sensor means; and

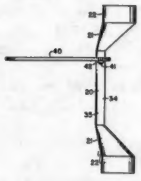
retaining ring means for securing the sensor means within the transverse aperture while allowing pull-out removal of the sensor means when the retaining ring means is removed.

4,982,653

METHOD AND APPARATUS FOR VENTILATING AN ENCLOSURE ACCESSED BY A MANHOLE

Russell B. Gordon; Jimmy A. Gordon, both of Atlantic Beach, Fla., and Marion W. Smith, Daphne, Ala., assignors to Saddle Vent, Inc., Atlantic Beach, Fla.

Continuation-in-part of Ser. No. 71,886, Jul. 10, 1987, Pat. No. 4,794,956. This application Dec. 30, 1988, Ser. No. 292,428
Int. Cl.[5] F24F *7/06*
U.S. Cl. 98—39.1 **26 Claims**



10. A method of ventilating an enclosure with a manhole

entrance with minimum obstruction at the manhole comprising the steps of:

(a) providing a conduit having outer open-ended sections which are substantially circular in cross-section, and an intermediate section which is non-circular in cross-section and which obstructs the cross-sectional area of the manhole by not more than about 10 percent; and

(b) locating the conduit within the manhole entrance such that the intermediate portion extends from inside the enclosure to outside the enclosure.

4,982,654

ELECTRIC KETTLE

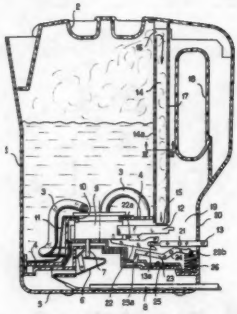
Christian Bourgeois, Dampierre, France, assignor to Seb S.A., Selongey, France

Filed Jan. 24, 1990, Ser. No. 469,188

Claims priority, application France, Jan. 27, 1989, 89 01016; Mar. 8, 1989, 89 03036

Int. Cl.[5] A47J *27/21, 27/62*

U.S. Cl. 99—323.3 **17 Claims**



1. An electric kettle comprising a water vessel (1) closed by a lid (2), said vessel being provided with an electric heating resistor (3) fixed on the bottom wall (4) of said vessel, said bottom wall (4) being removably supported on a base (5) provided with electric connection means (6) adapted to cooperate with complementary connection means (7) secured to the bottom wall (4) of the vessel, said vessel (1) being also provided with a temperature limiter (12) which is sensitive to the temperature of steam and adapted to cut-off the power supply at a predetermined temperature of the steam and a switch (13) being provided for turning-on the supply of current to the resistor when the vessel (1) is placed on the base (5), wherein the vessel (1) has a steam-flow duct (14) which extends substantially to the full height of the vessel and projects within said vessel, and wherein the lower end of said duct (14) has its opening opposite to the temperature-sensitive element (15) of the temperature limiter (12).

4,982,655

SAUCEPAN CAPABLE OF SETTING AMOUNT OF SOUP FINALLY LEFT THEREIN

Juang Wen-Der, 2F, No. 26-27, Lane 624, Sec. 2, Chung Shan Rd., and Yeh Wann-Fwu, No. 297, Jang Tsao Road, both of Jang Huah City, Taiwan

Filed Feb. 13, 1990, Ser. No. 479,613

Int. Cl.[5] A47J *27/21;* G01F *23/22*

U.S. Cl. 99—337 **1 Claim**

1. A saucepan capable of setting an amount of soup finally left therein, comprising

a hollow body having a nozzle portion that has an opening therein and is in communication with an inner portion of said body,

a cap,

a control means disposed in said nozzle portion,

a controller having a power input cable, a power output socket a thermal sensor wire, means for emitting warning sound, and an inner control circuit,

wherein

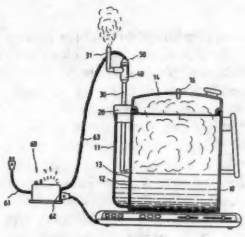
said cap is provided with a pressure-relieving hole and a pressure valve having a certain pressure limit for opening, and wherein the nozzle portion communicates with the inner portion of the body such that when a liquid is placed in the body, the level of said liquid in said nozzle portion is identical to that in said inner portion of said body, and said control means is externally connected with said controller,

said saucepan being characterized in that said control means comprises:

a sealing cork formed with a through hole and plugged into the opening of said nozzle portion;

a conduit provided with upper and lower openings and a scale and inserted through said through hole of said sealing cork into said nozzle portion, said conduit being axially adjustable in said through hole;

a connecting member having an upper opening, a lower opening and a lateral opening, said lower opening being connected with said upper opening of the conduit;



an exhalation pipe connected to said lateral opening and being open to the atmosphere; and

a thermal sensor disposed on said upper opening of said connecting member and connected to said controller by said thermal sensor wire so that said controller can be actuated by said thermal sensor,

the saucepan being capable of holding soup during cooking in a continuous heating process which generates steam in the body of the saucepan and during which the level of cooked soup in said saucepan goes down below the lower opening of said conduit,

wherein the pressure limit of the pressure valve is greater than the pressure in the body of the saucepan when the level of the soup is below the lower end of the conduit so that the steam in said saucepan will escape through said conduit and connecting member and finally discharge from said exhalation pipe, and wherein the thermal sensor is responsive to the passage of steam through the connecting member when the level of soup is below the lower end of the conduit to actuate said controller to cut off power to the power output socket and emit said warning sound so as to effectively control the amount of soup finally left in said saucepan.

4,982,656

STEAMER

Earlyn Stone, 33900 Sandlewood Rd., Nuevo, Calif. 92637

Filed Feb. 21, 1989, Ser. No. 313,249

Int. Cl.[5] A47J *23/04*

U.S. Cl. 99—403 **12 Claims**

1. A steaming vessel for comestibles which comprises:

a. a food tray formed by an open-topped vessel having:

(1) a stepped sidewall to provide an upper section and a

subjacent section of lesser cross sectional area with a peripheral shoulder therebetween,

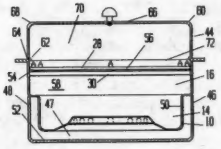
(2) a bottom wall with a raised central island;

(3) cross members projecting upwardly from said central island to provide a material support;

(4) a plurality of raised ribs of lesser height than said cross members and disposed about said island, each having a through slot; and

b. a plurality of apertures through said bottom wall at locations surrounding said raised central island;

c. a first closure member slidably received within said upper section and having an imperforate transverse sheet to



provide a cover for said food tray and thereby form a covered steaming chamber defined by the cover and food tray, said steaming chamber being of variable volume by virtue of sliding movement of the cover within said food tray;

d. a second closure having an upper plate and a peripheral, downwardly dependent skirt with an inwardly formed lip to be received into said food tray above said first closure member; whereby said steaming vessel is provided with an upper, heat isolation chamber above said first closure member and a cooking chamber beneath said first closure member.

4,982,657

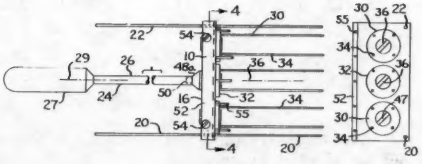
HOT DOG ROASTER

George Ghenic, 1760 Culver, Dearborn, Mich. 48124

Filed Jun. 11, 1990, Ser. No. 535,478

Int. Cl.[5] A47J *37/04*

U.S. Cl. 99—421 A **12 Claims**



1. A hand-manipulatable device for supporting hot dogs above a grille surface, comprising a housing having:

an upper edge, a lower edge, and two upright major faces, said housing being adapted to have its lower edge rest on a grille surface;

two elongated balancer elements extending from said housing normal to said major faces;

each balancer element projecting in opposite directions from the housing near its lower edge;

said balancer elements being spaced so that when the housing is positioned with its lower edge on a grille surface, the balancer elements will contact the grille surface at widely-spaced points to thereby maintain the housing in an upright position;

an elongated rotary handle projecting from one of the housing major faces; said handle extending generally horizontally when the housing is positioned on a grille surface, whereby the handle can be rotated around its axis without disturbing the housing;

a plural number of rotary hot dog grippers projecting from the other major face of the housing;

each hot dog gripper being adapted to hold a hot dog in a generally horizontal position a slight distance above a grille surface when the housing is in an upright position on the grille surface;

each hot dog gripper being mounted on the housing for rotation around a horizontal axis extending normal to said other major face of the housing;

each hot dog gripper being adapted to hold the associated hot dog in axial alignment with its rotational axis so that rotation of the gripper causes different side areas of the hot dog to be presented to the grille surface without changing the spacing of the hot dog from the grille surface; and,

means within the housing for driveably connecting the rotary handle to each hot dog gripper, whereby manual rotation of the handle causes each hot dog gripper to rotate.

4,982,658

BALE SHREDDING DEVICE

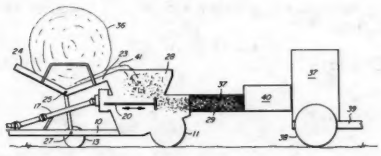
Leroy Knudson, P. O. Box 3, Consort, Alberta, Canada T0C 1B0

Filed Jan. 11, 1989, Ser. No. 295,735

Claims priority, application Canada, Jan. 12, 1988, 556307

Int. Cl.[5] B65B *13/00;* **B30B** *9/00*

U.S. Cl. 100—007 **4 Claims**



1. Apparatus for processing round bales of hay or like material, comprising, in combination:

(a) a round bale dispensing device including a discharge end and a bale support means provided with a bale drive mechanism for unwinding a supported bale to thus form a mat of said material and feeding the mat to said discharge end;

(b) a compressing device having an inlet and a discharge end said discharge end of the bale dispensing device communicating with the inlet of the compressing device, said compressing device also including rectangular cross-section forming means at said discharge end thereof, to form the material to a predetermined compact product;

(c) a grinder-mixer having an inlet, said discharge end of the compressing device including outlet means connected to said inlet of said grinder-mixer for further processing of said material by said grinder-mixer.

4,982,659

FABRIC PRINTING IMPLEMENT

James D. Cohen, 305 Newtown Rd., Wyckoff, N.J. 07481

Continuation of Ser. No. 870,150, Jun. 3, 1986, abandoned. This application Jul. 5, 1989, Ser. No. 377,752

Int. Cl.[5] B41F *17/38, 1/02*

U.S. Cl. 101—287 **4 Claims**

1. A fabric imprinting implement comprising:

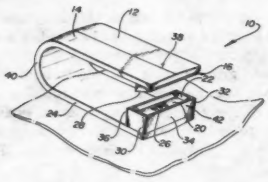
a flexible frame having first and second interior surfaces formed therein;

a tapered support surface formed on said first interior surface for engaging fabric to be imprinted;

a working surface having indicia thereon formed on said

second interior surface; opposite to said tapered support surface;

said working surface being formed within a housing affixed to said second interior surface, said housing extending upwardly from said second interior surface and having tapered fabric support walls extending outwardly from



said second interior surface and above said working surface, said working surface being located in a recess in said housing formed by said fabric support walls opposite said tapered support surface, whereby said working surface and said support surface move into and out of engagement with each other on manipulation of said frame.

4,982,660

CHAMBERED DOCTOR BLADE INKER SYSTEM

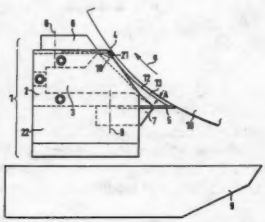
Anton Hamm, Neusäss, and Thomas John, Augsburg, both of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,810

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3843017

Int. Cl.[5] B41F *31/04*

U.S. Cl. 101—350 **12 Claims**



1. For combination with a printing machine having an anilox roller (10) and an ink trough (9);

a chambered doctor blade inker system,

wherein the chambered doctor blade inker system includes

a base body (2) which, in cross section, is essentially U-shaped and extends axially essentially parallel to the anilox roller, and a pair of lateral side walls (3) having upper and lower surfaces (20) axially closing off said base body and defining therewith an ink chamber;

at least one axially extending flexible doctor blade (4), having edge faces,

each of the side walls (3), when said system is in operating position with respect to the anilox roller (10), forming a circumferential gap (A) with respect to the anilox roller of between about 0.1 to 3 mm width;

means resiliently pressing the at least one doctor blade (4) against at least one of the upper and lower surfaces of said side walls (3);

the upper or lower surfaces of the at least one of said side wall (3) which contacts said doctor blade being formed with an inclined relief (19) to define a wedge-shaped gap (21) between the respective side wall and the at least one doctor blade (4), at a location between the upper or lower surface of the side wall which faces the at least one doctor blade (4);

an excess ink deflection shield (22) provided, extending towards said ink trough (9), said excess ink deflection shield being positioned adjacent an edge face of the doctor blade (4) and in fluid communication with said wedge-shaped gap (21).

4,982,661

METHOD OF INFUSING CATALYTIC CROSS-LINKING AGENTS INTO LITHOGRAPHIC PRINTING INK

Leon A. Zweig, 2336 Bennett Ave., North Bellmore, N.Y. 11710

Division of Ser. No. 304,594, Feb. 1, 1989, Pat. No. 4,906,296. This application Oct. 23, 1989, Ser. No. 425,063

Int. Cl.[5] C09D *5/20*; B41F *7/24*

U.S. Cl. 101—451 **8 Claims**

1. A process for imparting catalytic, cross-linking qualities to ink in lithographic printing processes having a dampening system with a fountain solution, comprising:

introducing a catalytic, cross-linking agent to the fountain solution, the agent being adapted to cross-link the ink upon exposure to ultraviolet radiation, infrared radiation or hot air;

transporting the catalytic agent to the ink via the fountain solution; and,

infusing the catalytic agent into the ink.

4,982,662

SHAPED PRIMER

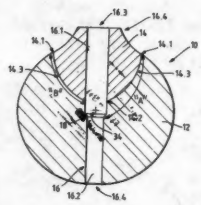
Michael W. Beck, Transvaal, South Africa, and David L. Kennedy, Dundonald, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 227,877, Aug. 3, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 489,739

Claims priority, application United Kingdom, Aug. 21, 1987, 8719846

Int. Cl.[5] F42C *19/09*

U.S. Cl. 102—205 **8 Claims**



1. A primer for use in blasting operations to initiate columns of bulk explosives which comprises:

a shaped body of detonating material with a passageway extending through the body of detonating material which provides a means for threading and suspending the primer substantially vertical onto a detonating cord, the passage of a shock attenuator insert having a length extending into the body of detonating material between 35 to 45% of an overall length of said passageway; and

the insert of inert material with a density which is less than that of the detonating material, which protrudes into the shaped body of detonating material and has a centrally aligned passage that constitutes an inlet portion of the passageway; said insert being laterally enclosed by an upper portion of the body of detonating material and having a density and shape providing means for propagation of a detonating shock wave into said enclosing upper portion of said detonating material through the body of said detonating material from a cord initiation point along the passageway below the insert before a shock wave

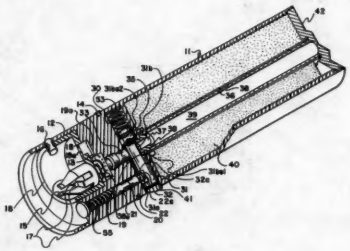
from a detonation of said detonating cord within the insert can pass laterally through the insert to the enclosing upper portion of the detonating material.

4,982,663

SAFE-AND-ARM ARRANGEMENT AND PROJECTILE ARRANGEMENT THEREWITH

David M. Scheve, Baltimore, and Robert W. Schnepfe, Jr., Upperco, both of Md., assignors to AAI Corporation, Hunt Valley, Md.

Filed May 16, 1986, Ser. No. 863,766
Int. Cl.[5] F42C *15/24, 15/34*
U.S. Cl. 102—251 **9 Claims**



1. A projectile arrangement having a safe-and-arm mechanism, comprising

a body for insertion into a launching barrel bore,

an ignition path for activating a charge of material,

a transversely slidable ignition-blocking/enabling member having an opening therein and having a first transverse slide position in which said ignition path is blocked, and a third transverse position in which said opening is positioned in path continuation of said ignition path to thereby enable ignition therepast,

means biasing said transversely slidable member toward said third position,

a longitudinally slidable setback member normally biased into engagement with said transversely slidable ignition-blocking/enabling member,

said longitudinally slidable setback member and said transversely slidable ignition-blocking/enabling member having mutually interlocking elements and being normally mutually interlocked in engagement with one another, each in a respective position in which said transversely slidable member is in said first position whereby said ignition path is blocked,

said transversely slidable ignition-blocking/enabling member having an end portion thereof normally extending beyond said body while in said first position and having a cam surface engageable with a barrel bore to thereby slidably move said transverse member into said body to a second release position as a function of insertion of said body into a barrel bore,

said second release position of said transversely slidable member effecting release of said longitudinally slidable setback member from said transversely slidable member, while continuing to block said ignition path,

said longitudinally slidable setback member being thereupon enabled, in the second release position of said transversely slidable member, to a condition for longitudinal slidable movement away from said transversely slidable member in response to inertial setback forces thereon during abrupt launch of said body from a launch barrel, to thereby release said transversely slidable member from slide-inhibiting action by said setback member,

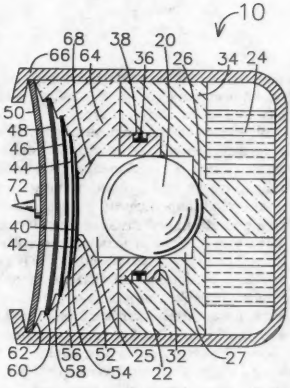
and thereby enabling said transversely slidable member to move to said third position upon subsequent exit from a barrel bore after abrupt launching.

4,982,664

CRASH SENSOR WITH SNAP DISK RELEASE MECHANISM FOR STABBING PRIMER

Peter Norton, 1 S. Lakeside, Lake Hopatcong, N.J. 07849

Continuation of Ser. No. 147,190, Jan. 22, 1988, abandoned. This application May 23, 1990, Ser. No. 527,643
Int. Cl.[5] F42C *1/04*
U.S. Cl. 102—272 **4 Claims**



1. A crash sensor comprising:

trigger means for activating a firing pin for initiating a chemical reaction,

a sensing mass movable from a normal resting position not contacting said trigger means to a firing position contacting said trigger means in response to deceleration during a crash,

said trigger means including a sequence of snap disks for amplifying the force applied thereto by said sensing mass for activating said firing pin,

a first snap disk of said sequence being adapted to respond to force exerted by said sensing mass by snapping from its state of higher energy equilibrium to its state of lower energy equilibrium and in doing so to initiate movement of a second snap disk in said sequence,

a last snap disk of said sequence being adapted to respond to force exerted by a next to last snap disk by snapping from its state of higher energy equilibrium to its state of lower energy equilibrium and in doing so to drive said firing pin,

any other snap disk of said sequence being adapted to respond to force exerted by the snap disk preceding it in said sequence by snapping from its state of higher energy equilibrium to its state of lower energy equilibrium and in doing so to initiate movement of the snap disk following it in said sequence,

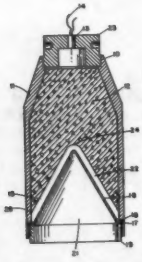
said first snap disk of said trigger means responding to the force exerted by said sensing mass only when said sensing mass reaches said firing position.

4,982,665

SHAPED CHARGE

Robert G. S. Sewell, and John Pearson, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1973, Ser. No. 421,365
Int. Cl.[5] F42B *12/10, 1/02*
U.S. Cl. 102—306 4 Claims



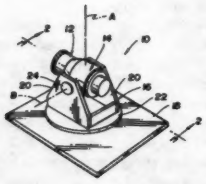
1. A shaped charge explosive device comprising:
a cylindrical housing open at one end having a central cavity for containing an explosive charge;
a detonatable explosive charge positioned within said cavity having formed at one end a symmetrical hollow cone shaped cavity that is positioned so its vertex lies on the longitudinal axis of said cylindrical housing and the surface of said cone shaped cavity intersects said cylindrical housing a predetermined distance from its open end;
a single cone shaped liner in juxaposition with said hollow cone shaped cavity formed in said explosive charge so as to be spaced a predetermined distance therefrom to form a continuous unbroken airgap layer, filled with an inert gas, between the exterior surface area of said cone shaped liner and the interior surface area of said cone shaped cavity formed in said detonatable explosive charge; and
a detonating charge positioned concentric with said cylindrical housing and opposite its open end.

4,982,666

CARTRIDGE FOR ACTIVE PROTECTION SYSTEM

Johann F. Wohler, Troy, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Division of Ser. No. 704,665, Feb. 25, 1985, Pat. No. 4,682,528.
This application Mar. 19, 1987, Ser. No. 27,645
Int. Cl.[5] F42B *12/00, 7/02*
U.S. Cl. 102—439 9 Claims



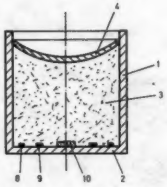
1. A cartridge for an active protection system comprising: a metal case; a first set of projectiles received within the case arranged in an outer ring; said first set of projectiles having flat sides and corner junctions; a second set of projectiles received within the case within the outer ring of the first set of projectiles; said second set of projectiles having generally curved outer surfaces; and means for launching the projectiles from the case to provide a dispersion angle by transverse force applied to the first set of flat sided projectiles by the second set of curved surfaced projectiles.

4,982,667

ARRANGEMENT FOR PRODUCTION OF EXPLOSIVELY FORMED PROJECTILES

Klaus Weimann, Rümmingen, Fed. Rep. of Germany, assignor to Franhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 742,072, Aug. 20, 1984, abandoned.
This application Oct. 28, 1988, Ser. No. 268,453
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329969
Int. Cl.[5] F42B *1/02*
U.S. Cl. 102—476 8 Claims



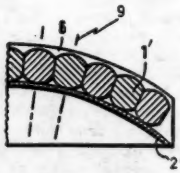
1. A device for producing an explosive formed projectile including a casing filled with an explosive charge, ignition means on a base side of said casing, and a metal insert covering the explosive charge on a head side of said casing, the device including at least three means arranged along a circle and at a distance from a longitudinal axis of the casing for causing a circumferential area of the casing to be subjected to different accelerations when a shock wave of the ignited charge reaches the insert, characterized in that said means for causing are provided in at least one of the insert, the explosive charge, and the ignition means on a circumferential circle in at least one of an external area thereof, and the casing on an external surface thereof so that one of the impact point of time and the impact energy of the shock wave differ in a circumferential area of the casing.

4,982,668

FRAGMENTATION PLATE FOR THE EXTERIOR OF AN EXPLOSIVE CHARGE DEVICE

Peter Bender, Kaarst, and Heribert Rohrbeck, Dusseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,032
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1988, 3822817
Int. Cl.[5] F42B *12/32*
U.S. Cl. 102—495 15 Claims



1. In a curved fragmentation plate for use in front of an explosive charge to form an outer portion of an explosive

charge device, with said fragmentation plate having an inner face oriented toward an explosive charge, an outer face oriented away from the explosive charge, and comprising a plurality of metal fragmentation elements which are arranged adjacent and in contact with one another, with each fragmentation element having a spherical surface portion oriented toward "said outer face" of said fragmentation plate; the improvement wherein: an inner shell is disposed at and at least partially forms said inner face of said plate, and supports and holds said fragmentation elements; said fragmentation elements are provided with lateral flattened surface portions at their areas of contact with adjacent said fragmentation elements, with said lateral flattened surface portions being formed about a common circumference of each respective said element so that each said element has a cross-section in the form of a regular polygon; said flattened surface portions of each of said fragmentation elements are tapered toward said inner face; and said fragmentation elements are arranged such that the axes of said fragmentation elements and extension lines from said flattened surface portions of said fragmentation elements meet in the center of the radius of curvature of said curved fragmentation plate.

4,982,669

SUBCALIBER DISCARDING SABOT PROJECTILE

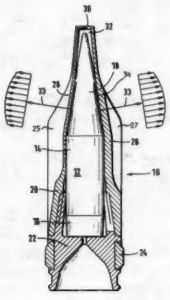
Bernhard Bisping, Ratingen; Michael Vagedes, and Siegfried Kessler, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 314,692

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803231

Int. Cl.[5] E42B *14/06*

U.S. Cl. 102—520 **12 Claims**



1. In a subcaliber, spin stabilized, discarding sabot projectile including a projectile body, with a conically tapered tip, and a discardable sabot which completely encloses said projectile body and includes a base portion and a plastic hood portion connected to said base portion, and with said hood portion having an inner conical surface which contacts at least a portion of said conically tapered tip of said projectile body and being provided, on its circumferential surface, with a plurality of symmetrically disposed grooves which extend in the longitudinal direction of said projectile and form desired break locations along which said hood portion of said sabot tears open into a plurality of segments after firing from a weapon and after the projectile has left the weapon muzzle; the improvement wherein the plastic material of said hood portion of said sabot in the bottom of each of said longitudinal grooves, at least in the region of said conically tapered projectile tip, has a wall thickness which is sufficiently thin that a given crack formation causing a slight separation of said material at said desired break locations is already initiated when the discarding sabot projectile is introduced, in rapid succession, into a cartridge chamber of a weapon.

4,982,670

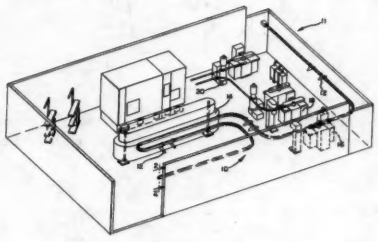
COVERED HANGER CONVEYANCE RAIL SYSTEM

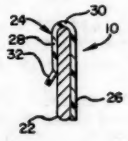
David R. Zorn, 142 S. Lodge La., Lombard, Ill. 60148, and David K. Zorn, 3 N. 210 Cuyahoga, West Chicago, Ill. 60185

Filed Mar. 3, 1989, Ser. No. 319,404

Int. Cl.[5] B61B *5/00*; A47H *15/04*

U.S. Cl. 104—93 **33 Claims**





1. In a hanger conveyance rail system for transporting at least one clothes hanger having a hook portion, the hanger conveyance rail system including a rail extending in a direction defining a moving direction, the rail having a curvature in the moving direction including at least one curve, the rail having a shape adapted to receive the hook portion of the hanger such that the hook is received on a top portion thereof, the improvement comprising:

a removable cover, the cover being (1) made of a flexible, low-friction material such that the cover is conformable to the curvature of the rail; (2) affixed to the rail such that the cover (i) extends along the moving direction and (ii) overlays at least the top portion of the rail; and (3) configured to have an open cross-section whereby the cover may be selectively removed from and overlaid on the rail over the rail.

4,982,671

VEHICLE WITH STEERABLE AXLES

Hugues Chollet; Jean-Louis Maupu, both of Arceuil, and Jean-Michel Petit, Le Pre Saint Gervais, all of France, assignors to Alsthom, Paris and Instit National de Recherche sur les Transports et leur Securite, Arceuil, both of, France

Filed Dec. 5, 1988, Ser. No. 280,117

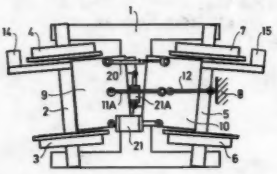
Claims priority, application France, Dec. 3, 1987, 87 16789

Int. Cl.[5] B61F *5/00, 3/04*

U.S. Cl. 105—168 **8 Claims**

1. A bogie, for a track guided vehicle including a body, said bogie comprising: a pair of independent wheel axles, measuring means for measuring the transverse positions of said wheel axles relative to the track, at least one measuring means for

measuring the angle between said axles, at least one actuator member acting between said axles to correct said angle and a



servo-control circuit receiving signals from said measuring means and generating control signals for said actuator member.

4,982,672

LOW NOX INCINERATION PROCESS

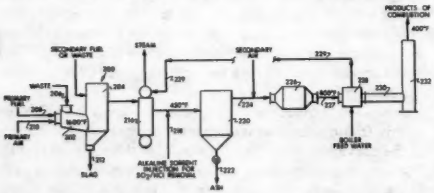
Ronald D. Bell, Austin, Tex., assignor to Radian Corporation, Austin, Tex.

Continuation of Ser. No. 252,681, Oct. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 122,067, Nov. 18, 1987, Pat. No. 4,811,555. This application Feb. 23, 1990, Ser. No. 488,376

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[5] F23G *7/06*

U.S. Cl. 110—346 **10 Claims**



1. A process for low NO_x hazardous waste incineration which comprises incinerating hazardous waste in the presence of air and fuel in a primary incineration zone to produce a first effluent gas stream, the amount of air supplied to said primary zone being in stoichiometric excess with respect to combustible materials provided by the fuel and waste being incinerated, whereby said first effluent gas stream also has excess oxygen with respect to combustible material therein; adding combustible materials to said first effluent gas stream to provide a combustible gas stream having a combustible material content in excess of the oxygen in said combustible gas stream and incinerating said combustible gas stream in a secondary incineration zone at a temperature in the range of 2000° to 2400° F. and under the reducing conditions arising from said excess combustible material content, to produce a heated oxygen-depleted gaseous effluent stream; converting at least a portion of the heat in said oxygen-depleted stream into steam, thereby cooling said stream; adding air to said cooled oxygen-depleted stream to produce a stoichiometric excess of oxygen in the resultant stream relative to combustible material present in said resultant stream and passing said resultant stream over an oxidizing catalyst to produce an oxidized gaseous stream; removing heat from said oxidized stream, and venting the resultant cooled stream of low NO_x content.

4,982,673

BUTTON SEWING MACHINE

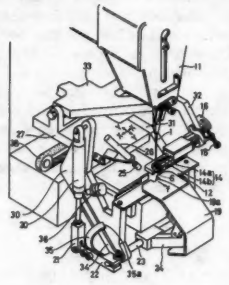
Toshihiko Kojima, Toyonaka, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka, Japan

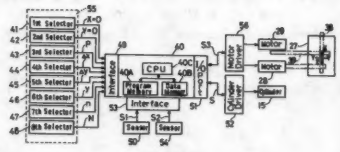
Filed Nov. 6, 1989, Ser. No. 431,777

Claims priority, application Japan, Nov. 7, 1988, 63-281988; Nov. 7, 1988, 63-281989; Nov. 7, 1988, 63-281990; Nov. 7, 1988, 63-145692

Int. Cl.[5] D05B *3/14*

U.S. Cl. 112—112 **8 Claims**





1. A button sewing machine which comprises:

a stitching needle supported for reciprocating movement up and down;

a needle plate having defined therein an opening through which said stitching needle moves during the reciprocating movement thereof;

button holder means for holding a sew-through button to be sewed on a piece of fabric;

fabric holding means for supporting the piece of fabric while the piece of fabric is folded to provide upper and lower segments of fabric which are positioned above and below the fabric holding means, respectively;

fabric retainer means for pressing the upper segment of fabric from above to urge it against said fabric holding means;

drive means for driving said button holder means and said fabric holding means reciprocatingly and cyclically in a horizontal plane in first and second directions perpendicular to each other;

button holder position switching means for selectively said button holder means to assume one of a button sewing position, in which the sew-through button can be sewed on the piece of fabric by means of a looped thread extending between the sew-through button and the piece of fabric, and a bundling position in which the looped thread fastening the sew-through button to the piece of fabric can extend generally horizontal while traversing over the opening defined in said needle plate;

operating status changing means for selectively switching said drive means to assume one of a first status, in which said button holder means and said fabric holding means can be reciprocatingly driven in one of the directions perpendicular to each other, and a second status in which said button holder means and said fabric holding means

can be simultaneously driven reciprocatingly in the directions perpendicular to each other; and

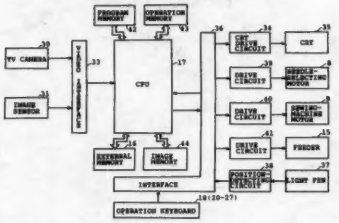
control means for detecting a completion of a button sewing job and operable in response to detection of the completion of the button sewing job to cause said button holder position switching means to assume the bundling position and also to cause said drive means to assume the second status.

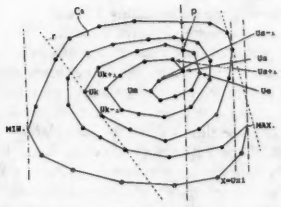
4,982,674

METHOD OF AND APPARATUS FOR PREPARING SEWING DATA FOR A MULTI-NEEDLE EMBROIDERY SEWING MACHINE

Atsuya Hayakawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 15, 1990, Ser. No. 524,274
Claims priority, application Japan, May 30, 1989, 1-136563
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 **16 Claims**





1. A control data preparing apparatus for an embroidery sewing machine that stitches an embroidery pattern on a workpiece under the control of control data, comprising:

a first memory means for storing outline data representing an outline of the embroidery pattern;

a designating means for designating a stitch-forming direction in which the embroidery sewing machine forms stitches;

a first computing means for dividing the outline of the embroidery pattern into divided outlines based on the outline data and the stitch-forming direction and for computing divided outline data representing the outlines of the divided outlines;

a second computing means for computing control data from the divided outline data; and

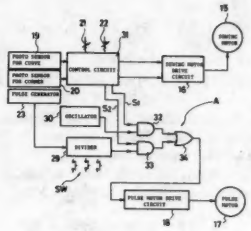
a second memory means for storing the control data.

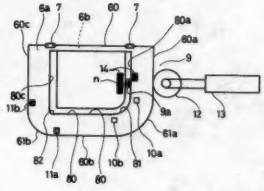
4,982,675

PROFILE STITCHER

Kazuo Taguchi, Sagamihara, and Yoshiaki Honma, Tokyo, both of Japan, assignors to Juki Corporation, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 289,986
Claims priority, application Japan, Dec. 26, 1987, 62-330908
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 **1 Claim**





1. A profile stitcher, comprising:

a throat plate;

a profiled frame for holding workpiece fabrics on said throat plate, said profiled frame having straight and curved edges;

said profiled frame including an inner groove engraved thereon, said groove having straight and curved portions corresponding to respective straight and curved edges of said profiled frame, the curved portions of said groove having a radius of curvature which differs from a radius of curvature of said curved edges corresponding to the curved portions;

a roller for pressing against said edges of said profiled frame;

a non-contact sensor for detecting said curved edges of said profiled frame;

motor means for rotating said roller; and

means for applying signals to said motor means such that said roller rotates at a speed which is faster than a workpiece fabric feeding speed when said noncontact sensor detects said curved edges of said profiled frame, and at a speed equal to said workpiece fabric feeding speed when said non-contact sensor does not detect said curved edges of said profiled frame,

wherein said motor means is a pulse motor and wherein said signals applying means includes:

a first pulse generator responsive to a speed of a main motor of a sewing machine, for generating a pulse signal causing said pulse motor to rotate said roller at a first speed equal to the workpiece fabric feeding speed;

a second pulse generator for generating a second pulse signal causing said pulse motor to rotate said roller at a second speed proportional to said first speed according to a value of the radius of curvature of said curved edge divided by the radius of curvature of said curved portion;

control means for selectively applying said first and second

pulse signals to said pulse motor such that said second pulse signal is applied when said non-contact sensor detects said curved edge, and said first pulse signal is applied when said non-contact sensor does not detect said curved edge.

4,982,676

POCKET CLOTH FOLDING DEVICE OF A POCKET SETTER

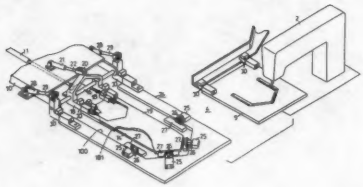
Satoshi Morii, Nagoya; Hiroyuki Mitsui, Kasugai, and Toshiaki Iwasaki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 15, 1990, Ser. No. 523,363

Claims priority, application Japan, May 23, 1989, 1-59537[U]

Int. Cl.[5] D05B *21/00, 35/00*

U.S. Cl. 112—121.15 7 Claims



1. A pocket cloth folding device of a pocket setter, comprising:

a base;

a support plate on which a pocket cloth is placed, the support plate being supported by the base;

a press plate attached to the base for pressing the pocket cloth on the support plate;

a folder support member detachab'y and rotatably attached to the base such that the folder support member rotates between an operational position and a preparatory position, where the folder support member surrounds the press plate when the folder support member is in the operational position;

a fluid pressure driver attached to the base for rotating the folder support member between the preparatory and the operational positions;

a plurality of folders mounted on the folder support member that shift between a projecting position and a withdrawn position, where, when the folder support member is in the operational position, the folders fold the bent edge of the pocket cloth to the underside of the support plate when the folders shift to the projecting position; and

a fluid pressure driver actuating system comprising:

a fluid pressure source connected to the fluid pressure driver for causing the fluid pressure driver to rotate the folder support member between the preparatory position and the operational position and

a fluid flow controller detachably connected to the fluid pressure driver for regulating the flow of the fluid exhausted from the fluid pressure driver; wherein

the fluid flow controller is mounted on the folder support member and an amount by which the fluid flow controller regulates the flow of the fluid exhausted from the fluid pressure driver is predetermined according to the folder support member on which the fluid flow controller is mounted.

4,982,677

PATTERN-MATCHING SHEET-JOINING MACHINE

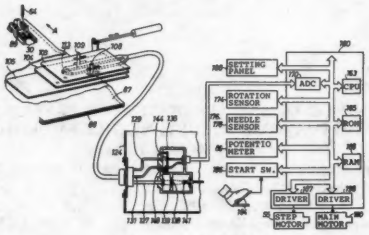
Etsuzo Nomura, Kasugai; Hirokasu Takeuchi; Shigeru Suzuki, both of Nagoya; Kazunori Irie, Ichinomiya, and Hirosumi Itoh, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

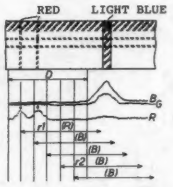
Filed Jan. 27, 1989, Ser. No. 302,313

Claims priority, application Japan, Jan. 28, 1988, 63-17693; Jan. 28, 1988, 63-17695

Int. Cl.[5] D05B *27/06, 27/08*

U.S. Cl. 112—314 41 Claims





6. A sewing machine for sewing two sheets, the sheets each having identical color patterns thereon, so that the positions of the same color patterns on each of the sheets coincide with each other comprising:

a stitch forming means including a needle;

first and second feeding means for feeding one of the sheets;

first and second photo-sensing means each for optically sensing a color pattern on one of the sheets during feeding, and for generating intensity data for a plurality of different colors;

a mismatch-detecting means for calculating a mismatch distance of the patterns on the two sheets based on the intensity data for the plurality of different colors; and

a feed adjusting means for adjusting at least one of the feeding means to match the patterns, based on the calculated mismatch distance.

4,982,678

METHOD AND APPARATUS FOR IMPEDING THE SPILLAGE OF A LIQUID CARGO FROM A DAMAGED WATER-TRAVELING VESSEL

Carl R. Frederick, Plainfield, N.J., assignor to Frederick Research Corp., Plainfield, N.J.

Filed Jun. 1, 1989, Ser. No. 359,952

Int. Cl.[5] B63B *25/12*

U.S. Cl. 114—74 R 52 Claims

1. A device for impeding the flow of liquid cargo from a storage compartment of a water-traveling vessel upon damage to a hull of said vessel, said device comprising:

a liner including:

a sheet of fabric material resistant to the liquid cargo and

having a predetermined limited degree of permeability thereto; and

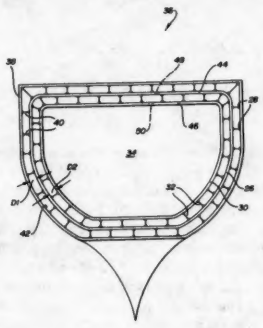
reinforcement means attached to said sheet for strengthening said fabric material and for at least inhibiting a tear from spreading in said sheet more than a predetermined distance from a point of perforation of said sheet; and

support means for supporting said liner inside the storage compartment of the water-traveling vessel.

34. A sheet for use in fabricating devices for at least partially containing petroleum temporarily, said sheet comprising:

a web of petroleum-resistant fabric material having a predetermined limited degree of permeability to petroleum; and

reinforcement means attached to said web for strengthening said fabric material and for at least inhibiting a tear from



spreading in said sheet more than a predetermined distance from a point of perforation of said sheet, said reinforcement means including a multiplicity of ribs disposed in triangles having exactly two different sizes, triangles of a first size of said two different sizes having a common side length equal to approximately one-half a common side length of triangles of a second size of said two different sizes.

42. A device for impeding the flow of petroleum from a storage compartment of a water-traveling vessel upon damage to a hull of said vessel, said device comprising:

a liner of petroleum-resistant material having a predetermined limited degree of permeability to petroleum; and

support means for supporting said liner inside the storage compartment of the vessel.

4,982,679

WINGSAIL FLAP TORQUE EQUALIZATION

John G. Walker, Tipwell House, St. Mellion, Cornwall, United Kingdom PL12 8RS)

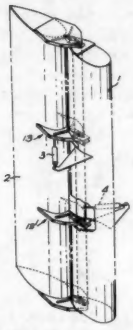
Continuation-in-part of Ser. No. 5,167, Jan. 2, 1987, Pat. No. 4,770,113. This application Jul. 22, 1988, Ser. No. 222,823

Claims priority, application United Kingdom, May 2, 1985, 8511232; May 2, 1985, 8511233; May 2, 1985, 8511234; May 2, 1985, 8511235

Int. Cl.[5] B63H *9/04*

U.S. Cl. 114—102 **10 Claims**

1. A self-trimming wingsail assembly comprising a thrust wingsail having a symmetrical upright leading airfoil having a leading edge and a trailing edge and a symmetrical upright trailing airfoil having a leading edge and a trailing edge, the leading edge of the trailing airfoil being positioned closely behind the trailing edge of the leading airfoil and means for mounting the trailing airfoil for pivoting movement about an upright axis in the plane of symmetry of the leading airfoil from an aligned position in which the trailing airfoil is coplanar with the leading airfoil to positions to each side of and angularly displaced from said aligned position, the assembly being freely rotatable about an upright axis, wherein the trailing airfoil is moved to and from said angularly displaced positions by at least one pair of double-acting fluid operated cylinders, each cylinder having a piston separating an annulus side of the cylinder through which a piston rod passes from a full bore side of the cylinder, the cylinders being connected so that the trailing airfoil is moved by co-operative action of a first one of



said pair of cylinders on an extending stroke and a second one of said pair of cylinders on a contracting stroke and in which fluid flow during movement of the trailing airfoil is simultaneously to the annulus side of one cylinder of the pair and to the full bore side of the other cylinder of the pair.

4,982,680

HYDRAULIC ACTUATOR

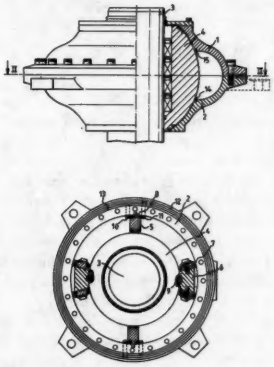
Hans P. Hildre, Tennfjord, Norway, assignor to Tenfjord A.S., Tennfjord, Norway

Filed Jun. 7, 1989, Ser. No. 362,483

Claims priority, application Norway, Jun. 10, 1988, 882578

Int. Cl.[5] F01C *9/00*

U.S. Cl. 114—150 **2 Claims**



1. Hydraulic actuator for turning movement of a spindle, especially a rudder (3), comprising

a housing having a lower part (2) adapted to be fixed to the ship hull and an upper part (1) adapted to be secured to the lower part,

a ball shaped hub journalled slideably in the lower and upper housing parts, which together define a substantially torus shaped guiding path,

the rudder extending through the hub and secured thereto for rotation therewith about its axis,

at least one partition wall (5) connected to the housing and arranged in and having seals (8) abutting tightly to the guiding path,

at least one carrier (6) arranged in the guiding path and having seals sliding tightly against the guiding path, and

fluid conduit means leading to each side of each partition wall (5) for alternatively pressurizing or depressing the two spaces intermediate the partition wall and carrier on both sides of the partition wall,

said hub being fixed to the carrier for rotation therewith but free to rotate with respect to the carrier about an axis transverse to the axis of rotation of the rudder.

4,982,681

FLOATING MARINE STRUCTURE OF THIN DISC FORM

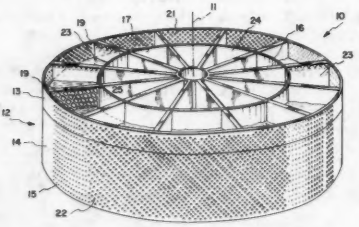
Gerard E. Jarlan, Versailles, France, assignor to National Research Council of Canada/Conseil National de Recherches du Canada, Ottawa, Canada

Continuation of Ser. No. 147,669, Jan. 25, 1988, abandoned, which is a continuation of Ser. No. 803,295, Dec. 2, 1985, abandoned. This application Nov. 7, 1988, Ser. No. 268,059

Claims priority, application Canada, Dec. 4, 1984, 469302

Int. Cl.[5] B63B *35/44*

U.S. Cl. 114—264 **22 Claims**



12. A floatable marine structure for carrying large loads, comprising:

(a) an outer shell wall of generally cylindrical form and having a diameter from about four to six times the operating draft of the structure, said shell wall being substantially perforated throughout its cross-sectional area, said perforated area comprising an aggregate 26% to 35% of the total cross-sectional area of said shell wall,

(b) a buoyancy tank having a cylindrical wall spaced substantially inwardly from said shell wall;

(c) an imperforate base disc extending below said shell wall and said wall of said tank for interconnecting the same in spaced relation,

(d) an annular chamber defined by said disc and said walls for receiving and partly conforming a volume of seawater admitted thereto through the perforations in said outer shell, the radial dimension or width of said chamber being at least 24% of the diameter of said outer shell, and wherein

(e) said volume of seawater in said annular chamber is in the range from 80% to 125% of the displacement of the structure, and

(f) a working deck rigidly secured to the top of the structure.

4,982,682

HULL CONSTRUCTION FOR SMALL WATERCRAFT

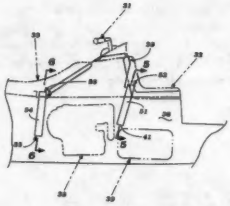
Tsutomu Hattori, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 8, 1989, Ser. No. 405,631

Claims priority, application Japan, Sep. 8, 1988, 63-225738

Int. Cl.[5] B63B *35/73*

U.S. Cl. 114—270 **17 Claims**



1. A hull for a small watercraft comprised of a lower portion adapted to be at least partially submerged in the water when said hull is in its normal orientation in the water, a deck secured to said lower portion and defining outer sides and with said lower portion a longitudinally extending cavity, a pair of transversely spaced flotation devices extending longitudinally along said hull on opposite sides of said cavity and extending vertically toward the upper portion of the hull, means providing a riding area for a rider seated in straddle position on said deck above and to the rear of the front thereof, said hull being defined by foot well portions in which the feet of the rider can be positioned, said flotation devices extending along said upwardly of the foot well portions and terminating at the upper ends of the outer sides of said deck, an engine positioned within said cavity centrally of said hull in the longitudinal direction, and a vent pipe extending through said hull and into said cavity, said vent pipe having open opposite ends for supplying cooling and circulating air to said engine, the upper end of said vent pipe lying above the water level when said hull is in its normal upright condition and the lower end of said vent pipe lying above the water level when said hull is inverted.

17. A hull for a small watercraft having a deck portion defining a seat bounded by a pair of foot areas to receive the feet of a rider seated upon said seat in straddle position, said foot areas opening through the rear of the transom of said hull for permitting water to flow from said foot areas when the hull is being righted, a pair of ramps formed at the ends of said foot area and configured so as to preclude water entry into said foot area, said ramps each defining an opening by a pair of spaced surfaces defining shoulders at their upper ends, a combined closure member and valve plate comprising a rigid member affixed to said shoulders and defining a water flow gap, and a flap type check valve depending therefrom and forming a closure for precluding water entry to said foot areas and for opening to permit water to drain from said foot areas.

4,982,683

HAND-HELD TRAFFIC SIGNALING DEVICE

William D. Earnest, Jr., 712 Ardmore Rd., West Palm Beach, Fla. 33401

Filed Oct. 4, 1989, Ser. No. 416,880

Int. Cl.[5] G09F *21/02, 7/22*

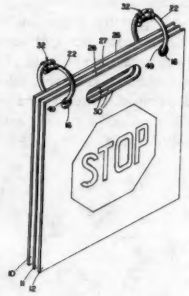
U.S. Cl. 116—63 P **12 Claims**

1. A hand-held traffic signaling device, comprising:

at least two information panels, said at least two information panels each comprising front and back sides, at least one of said sides having information indicia thereon, said panels having a grasping means comprising handle openings in each of said panels dimensioned to permit a user to insert the hand through the openings and to simultaneously

grasp all of said panels when said panels are juxtapositionally aligned; and,

a means of connection, said means of connection being



adapted to circularly engage adjacent side edge portions of said panels, and thereby to allow said panels to rotate about said means of connection to permit alternate display of said indicia on said panels.

4,982,684

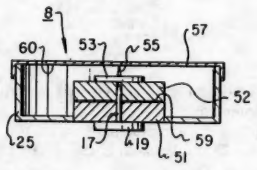
DIRECTIONAL SHOCK DETECTOR

Ulyss R. Rubey, Graham, Tex., assignor to Detectors, Inc., Graham, Tex.

Continuation-in-part of Ser. No. 357,992, May 30, 1989, abandoned. This application May 8, 1990, Ser. No. 520,717

Int. Cl.[5] G01L *5/00;* **H01H** *35/14*

U.S. Cl. 116—203 **66 Claims**



1. A detector for forwarding an indication if a predetermined acceleration has been received by a container, article, object and the like comprising:

a. attachment means for attaching said detector to the container for monitoring if said predetermined acceleration has been received;

b. indicating means for indicating that said predetermined acceleration has been received; said indicating means comprising first and second objects each of which produce a magnetic field, said first object being connected with said attachment means, said second object being movable with respect to said first object when said detector is subjected to said acceleration;

c. retaining means for retaining said second object stationary with respect to said first object, said retaining means comprising a pin that is received by said first and second objects, said retaining means being removable to allow movement of said first object.

4,982,685

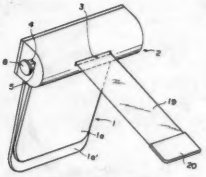
CLIP-CARRYING BOOKMARKER

Mitsuhiko Abe, No. 278-1, Zennoji, Sakado, Saitama-ken, Japan

Filed Jan. 23, 1990, Ser. No. 468,671

Int. Cl.[5] B42D *9/00*

U.S. Cl. 116—237 **1 Claim**



1. A clip-carrying bookmarker comprising a clip formed out of a resilient material and consisting of a pair of clamp members provided on a lower side of a strap storage box; said strap storage box being provided with a strap withdrawal port at a central portion of a front side thereof and a square hole in a side wall thereof; a cross-sectionally square operating shaft member fitted slidably through said square hole in said strap storage box, and having a flange-carrying drum at an end portion of said operating shaft member which is located inside of said strap storage box, and a small diameter bore of a predetermined depth in a core portion of said operating shaft member; a coiled spring provided between the flange of said flange carrying drum of said operating shaft member and a support wall in said strap storage box and urging said flange carrying drum constantly toward the outside of said strap storage box; a strap feed and take-up drum opened at one end thereof and closed at the other, and provided with a support shaft projecting outward from said closed end thereof and fitted rotatably through a bore made in said support wall in said strap storage box; a guide rod fitted fixedly in a core portion of said support wall and fitted slidably at its free end portion in said bore in said operating shaft member; a pair of annular ratchets having teeth, which can be meshed with each other, on the opposed surfaces of said annular ratchets, one ratchet being mounted immovably on the free end portion of said support shaft of said strap feed and take-up drum, the other ratchet being fitted firmly into said flange carrying drum of said operating shaft member and movable with said flange carrying drum; a rubber string provided in a twisted state and set at one end on a rubber string fastening catch formed at a central portion of the inner surface of said strap feed and take-up drum and at the other end on a rubber string fastening projection formed in the interior of said strap storage box; and a strap fastened at its one end portion to said strap feed and take-up drum and wound in its entirety around said strap feed and take-up drum, and paid out at the other end portion thereof through said strap withdrawal port with a tag provided on a second end portion of said strap.

4,982,686

CONVERGING CHAMBER SATURATOR WITH REMOVABLE INSERT

Eliot R. Long, Arlington Heights, Ill., assignor to Miply Equipment, Inc., Northfield, Ill.

Division of Ser. No. 73,516, Jul. 15, 1987, Pat. No. 4,849,261, which is a continuation-in-part of Ser. No. 883,550, Jul. 9, 1986, Pat. No. 4,702,943. This application Jun. 5, 1989, Ser. No. 361,403

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[5] B05C *3/12*

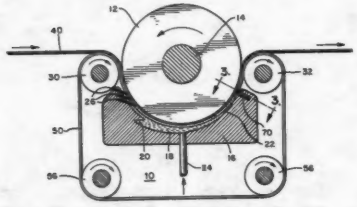
U.S. Cl. 118—406 **13 Claims**

1. In a saturator of the type comprising two opposed elements which define a converging saturating chamber therebe-

tween, which chamber converges from a relatively deeper entrance region to a relatively shallower exit region, and means for moving a web through the saturation chamber along a translation axis from the entrance region to the exit region, wherein the chamber is shaped to pressurize saturant in the chamber, the improvement comprising:

at least one insert;

means for removably mounting the insert to one of the two opposed elements such that the insert forms a surface of



the converging chamber and extends from the exit region at least partially towards the entrance region; and

means, included in the moving means, for defining at least one wall of the chamber having a surface movable in the same general direction as the web is movable.

11. The invention of claim 10 wherein the means for removably attaching the insert to the chamber defining element further comprises means for removably mounting the support member to the chamber defining element.

4,982,687

METHOD AND APPARATUS FOR MANUFACTURING MAGNETIC RECORDING MEDIUM

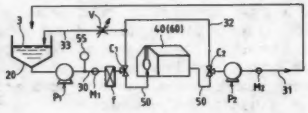
Shinsuke Takahashi; Norio Shibata, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 12, 1990, Ser. No. 491,991

Claims priority, application Japan, Mar. 16, 1989, 1-62274

Int. Cl.[5] B05C *3/18, 5/02*

U.S. Cl. 118—410 **5 Claims**



1. An apparatus for applying a liquid to a surface of a moving web, comprising:

an extruder having an inlet for receiving a coating liquid, an extrusion slit for applying coating liquid to a web, and an outlet for discharging excess coating liquid received through said inlet but not coated on said web;

a liquid storage tank for holding a supply of said coating liquid;

first pump means for pumping coating liquid from said tank to said inlet of said extruder;

first and second return passages for returning excess coating liquid to said tank;

second pump means for pumping excess coating liquid from said outlet back to said tank through said first return passage;

a bypass passage connected to said second return passage; and

valve means connected to said inlet and outlet of said extruder and said second return passage, said valve means having a first position wherein all liquid from said first pump means is passed to said inlet of said extruder wherein a first quantity of coating liquid is coated on said web and a second quantity of coating liquid is discharged from said outlet and pumped by said second pump means through said first return passage to said tank, and a second position wherein a quantity of coating liquid equal to said first quantity is passed through said second return passage to said tank and a quantity of coating liquid equal to said second quantity is passed to said second pump means through said bypass passage without passing through said extruder and returned to said tank, wherein quantities of coating liquid pumped by said first and second pump means remain unchanged for said first and second positions of said valve means.

4,982,688

APPARATUS FOR APPLYING GLUE TO ENDLESS THREADS

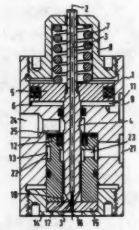
Josef Rothen, Solingen, Fed. Rep. of Germany, assignor to Macon Klebetechnik GmbH, Erkrath, Fed. Rep. of Germany

Filed Dec. 30, 1988, Ser. No. 292,175

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1987, 3744587

Int. Cl.[5] B05C *3/12*; B29C *47/02, 47/12*

U.S. Cl. 118—420 **1 Claim**



1. An apparatus for applying a matrix material to threadlike structures, comprising:

a housing having a longitudinal axis;

a nozzle needle displaceable in the housing parallel to said longitudinal axis;

said nozzle needle having an axial bore through which a threadlike structure is guided;

a chamber provided in the housing about a front end of the nozzle needle and being in fluid communication with a matrix material supplying means;

a nozzle element arranged in the housing having a nozzle channel which is coaxial with said axial bore to receive a coated threadlike structure;

said nozzle element having a valve seat reciprocating with said valve element of the nozzle needle;

said nozzle needle having valve element disposed at a front end thereof;

said valve element and valve seat forming an annular injecting channel therebetween;

a drive means to controllably advance said nozzle needle toward said nozzle element until it abuts the valve seat to provide a seal; and

a return channel having a valve arrangement means for returning the matrix material to the matrix supplying means when said valve element abuts said valve seat.

4,982,689

DEVELOPING APPARATUS HAVING A DEVELOPING ROLLER WITH FINE CONCAVITIES

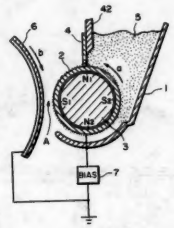
Mitsuru Honda, Yokohama, and Takahiro Kubo, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

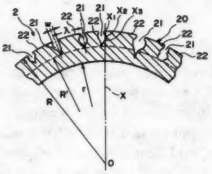
Filed May 30, 1989, Ser. No. 358,568

Claims priority, application Japan, May 30, 1988, 63-131950

Int. Cl.[5] G03G *15/08*

U.S. Cl. 118—656 **9 Claims**





6. A developing apparatus for developing an electrostatic latent image, comprising:

a container for containing a developer; and

a rotatable developing roller for carrying the developer supplied from said developer container into a developing zone where the electrostatic latent image is developed;

said developing roller having a developer carrying surface having finely smooth surface portions and fine concavities, wherein each of said concavities has an opening smaller than a size of an interior portion thereof.

4,982,690

DEVELOPING DEVICE WITH MAGNETIC SUPPLY SEALS

Naotaka Funayama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

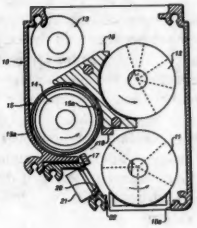
Filed Sep. 23, 1988, Ser. No. 248,774

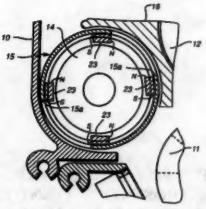
Claims priority, application Japan, Oct. 9, 1987, 62-155127[U]

Int. Cl.[5] G03G *15/09*

U.S. Cl. 118—657 **4 Claims**

1. In a developing device comprising a developer tank containing therein a developer magnet roller for supplying developing agent to a photoreceptor, a screening member for preventing the supply of developing agent to said developer magnet roller, a partitioning member disposed opposite said screening member and sealing members for sealing gaps formed around said screening member with said tank and with said partitioning member, the improvement wherein said sealing





members are affixed to said screening member and comprise magnets.

4,982,691

DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS HAVING MAGNET ROLLERS

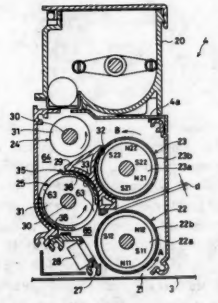
Masato Asanuma; Masatoshi Kaneshige, and Toyoka Aimoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1989, Ser. No. 334,099

Claims priority, application Japan, Apr. 5, 1988, 63-83945; Apr. 5, 1988, 63-83947; May 10, 1988, 63-112764

Int. Cl.[5] G03G *15/09*

U.S. Cl. 118—658 **6 Claims**



1. A developing device for an electrophotographic apparatus, said device comprising:

a developing magnet roller having a sleeve around a columnar magnet piece and being disposed opposite a photoconductor capable of having an electrostatic latent image

formed thereon, said sleeve being adapted to rotate around said magnet piece in a specified direction,

a transfer magnet roller disposed adjacent said developing magnet roller for receiving used developer from said developing magnet roller and transferring said received developer away from said developing magnet roller, and

a separator disposed between said developing magnet roller and said transfer magnet roller for separating said developing magnet roller from said transfer magnet roller, a gap being formed between said separator and said sleeve of said developing magnet roller, said gap being greater than the thickness of the layer of developer not transferred to said transfer magnet roller and remaining on said sleeve of said developing magnet roller, said developer not transferred passing through said gap downward along said specified direction.

4,982,692

APPARATUS FOR LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES

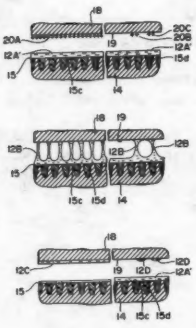
Ryosuke Uematsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,553

Claims priority, application Japan, Feb. 16, 1988, 63-34478; Feb. 16, 1988, 63-34492

Int. Cl.[5] G03G *15/10, 17/04*

U.S. Cl. 118—661 **5 Claims**



1. In an apparatus for liquid development of an electrostatic latent image, the apparatus having a carrier member having a smooth surface on which a liquid developer is to be carried for development of an electrostatic latent image formed on a surface of another carrier which can be brought close to the smooth surface of said carrier member,

the improvement comprising said smooth surface comprising a plurality of first regions, which are spaced from each other and uniformly distributed over substantially the entire area of said smooth surface, and a second region which occupies the spacings between said first regions, said first regions being provided by an electrically conductive material and electrically connected to a power supply which provides a biasing potential for liquid development, said second region being provided by a dielectric material.

4,982,693

SEMICONDUCTOR VAPOR PHASE GROWING APPARATUS

Hitoshi Ebata, Mishima, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

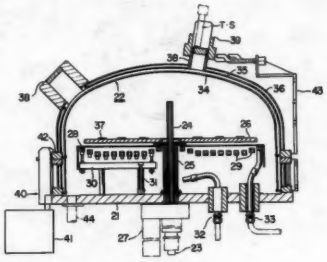
Filed Mar. 4, 1983, Ser. No. 472,248

Claims priority, application Japan, Jun. 28, 1982, 57-111131

The portion of the term of this patent subsequent to Oct. 8, 2004, has been disclaimed.

Int. Cl.[5] C23C *13/08*

U.S. Cl. 118—666 **4 Claims**



1. In a semiconductor vapor phase growing apparatus wherein a semiconductor wafer is disposed in a reaction furnace, which includes a source for heating and a gas supply means and the output of said source for heating, the temperature of the wafer, and flow quantities of gases supplied to the reaction furnace for vapor phase growing a semiconductor on the wafer by a chemical reaction of the gases are controlled by a control unit according to predetermined sequences, the improvement comprising temperature detecting means for detecting the temperature of the wafer in the reaction furnace, and output control means controlling the output of said source of heating according to a given reference value, wherein said control unit includes memory means for storing a program for executing said sequences and linearly raising and lowering the wafer temperature at a predetermined temperature gradient in a plurality of divided time interval units by making different rates of temperature change in respective time interval units, and means for processing said program.

4,982,694

AUTOMATIC COATING SYSTEM

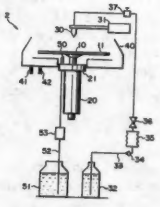
Masashi Moriyama, Tokorozawa, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 307,060

Claims priority, application Japan, Feb. 10, 1988, 63-29332

Int. Cl.[5] B05C *3/09*

U.S. Cl. 118—697 **13 Claims**



1. An automatic coating system, comprising:

coating means for coating a coating material on an object to

be coated in accordance with a coating operation which includes a plurality of steps;

input means for manually inputting a signal for operating a single step of said plurality of steps;

operation starting means for starting said single step when the signal is input; and

operation stopping means for automatically stopping the coating operation when the step is finished.

4,982,695

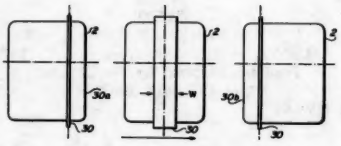
METHOD AND APPARATUS FOR CONTROLLING THE THICKNESS DISTRIBUTION OF AN INTERFERENCE FILTER

Matthew S. Brennesholtz, Waterloo, and Paul J. Patt, Mount Kisco, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 340,835, Apr. 20, 1989, Pat. No. 4,942,063. This application Apr. 2, 1990, Ser. No. 504,191

Int. Cl.[5] C23C *16/00*

U.S. Cl. 118—729 9 Claims



1. A vacuum evaporation apparatus for forming vapor deposited layers from at least one source material on a plurality of moving substrates, the apparatus comprising a vacuum chamber, means within the chamber for heating the source material to vaporization temperature, means for moving the plurality of substrates in a path relative to the source material while maintaining the substrates in positions approximately equidistant from the source material,

characterized in that at least one dodger is rotatably mounted in the vacuum chamber between the source material location and the path of the substrates, the axis of rotation of the dodger being normal to the direction of travel of the substrates and substantially parallel to the substrate, and in that means are provided for rotating the dodger when each substrate is at least partially behind the dodger, so that during rotation of the dodger the substrates are at least partially shielded from and partially exposed to the source material.

4,982,696

APPARATUS FOR FORMING THIN FILM

Mikio Kinoshita, Kawasaki; Wasaburo Ohta, Yokohama, and Masashi Nakazawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,377

Claims priority, application Japan, Jan. 8, 1988, 63-2089; Jan. 8, 1988, 63-2090; Jan. 8, 1988, 63-2091; Jan. 11, 1988, 63-3595; Jan. 11, 1988, 63-3596; Jan. 11, 1988, 63-3597; Feb. 4, 1988, 63-24829; Mar. 23, 1988, 63-68732; Dec. 15, 1988, 63-316942

Int. Cl.[5] C23C *16/50*

U.S. Cl. 118—723 13 Claims

1. An apparatus for forming a thin film comprising:

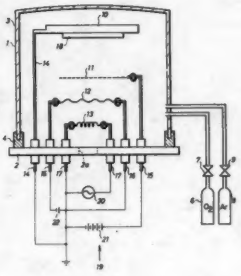
a vacuum container to which an active gas, an inert gas or a mixture thereof is introduced;

a source of evaporation from which a substance is evaporated, disposed in said vacuum container;

a counter electrode disposed in said vacuum container and holding a substrate for forming a thin film thereon in such a manner as to be opposed to said source of evaporation;

a grid disposed between said source of evaporation and said counter electrode and having openings which allow said substance being evaporated to pass therethrough;

a filament for thermionic emission disposed between said grid and said source of evaporation; and



a power source means for establishing a predetermined electric potential relationship between said grid, said counter electrode and said filament in which the potential of said counter electrode is negative relative to the potential of said grid and positive relative to the potential of said filament.

4,982,697

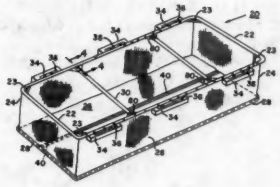
AQUATIC NET PEN AND METHOD

Gregor N. Neff, 85 Myrtle Ave., Dobbs Ferry, N.Y. 10522

Filed Dec. 21, 1987, Ser. No. 135,781

Int. Cl.[5] A01K *61/00*

U.S. Cl. 119—3 18 Claims



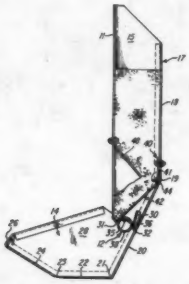
1. A cage for containing aquatic animals, said cage comprising, in combination, a bottom wall, side walls joined to said bottom wall to form aquatic animal-retaining enclosure, framing means for framing an opening to said enclosure, a plurality of studs extending from said framing means at spaced intervals, each of said studs having an enlarged portion at a location spaced from said framing means, a cover for said opening, said cover including netting made of resilient strands forming a plurality of holes, the size of each of said holes being smaller than said enlarged portion on each of said studs, whereby said cover can be secured to said frame by forcing said enlarged portion of each of a plurality of said studs through one of said holes, said cover including a strengthening border extending along opposite edges of said cover and near said studs.

4,982,698

ANIMAL OPERATED FEEDER

Herbert M. Sollars, 433 Kathryn St., Washington Court House, Ohio 43160

Filed Aug. 10, 1987, Ser. No. 83,065
Int. Cl.[5] A01K 5/00
U.S. Cl. 119—54 10 Claims



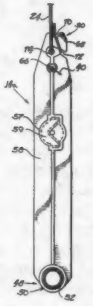
3. An animal operated self feeding apparatus particularly advantageous for use in feeding farrowing sows comprising means defining a substantially vertically oriented feed holding bin having a feed inlet and means defining a feed outlet, means normally providing a closure of said outlet, means interrelated with said closure means to normally define a restricted passage for feed to move to the vicinity of said outlet, a portion of said closure means being accessible for a restricted limited displacement thereof from said outlet by an animal desiring to feed, said means normally defining said restricted passage providing means constructed and arranged to limit the rate of flow of feed from said bin and the feed discharged from said bin to a small amount on the occasion of any effort by an animal to displace said closure means from said outlet, said means interrelated with said closure means being interconnected with said bin and operably related to said closure means to block any passage of feed from said bin in the event the displacement of said closure means from said outlet reaches a predetermined limit.

4,982,699

FLOOR WATERER HANGER

Timothy W. Momont, Nappanee, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Jun. 30, 1989, Ser. No. 375,150
Int. Cl.[5] A01K 7/00
U.S. Cl. 119—72.5 18 Claims



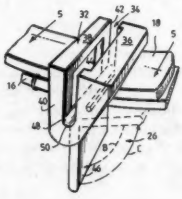
1. A watering system for use in animal husbandry, said watering system having a water pipe for transporting water through said watering system, suspension means for suspending said watering system above a surface, support means for strengthening and structurally supporting said watering system, and hanger means for retaining said watering system components in operative engagement, said hanger means comprising; a vertically oriented beam member having a top end and a bottom end, a suspension horn integrally formed on said top end of said vertically oriented beam member for adjustably engaging said suspension means for suspending said hanger means form said suspension means, a water pipe supporting portion integrally formed on said bottom end of said vertically oriented beam member for cooperatively engaging said water source pipe, and support means engaging means integrally formed and positioned generally between said top end and said water pipe supporting portion for slidably retaining said support member.

4,982,700

FERRET HARNESS

Richard A. Gordon, 95 W. 3rd St., Freeport, N.Y. 11520

Filed Jul. 20, 1988, Ser. No. 221,714
Int. Cl.[5] A01K 29/00
U.S. Cl. 119—96 7 Claims



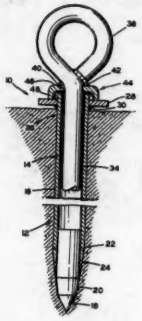
1. An animal restraint comprising in combination, at least one body encircling member having opposite end portions which lie over each other when said restraint is disposed in its mode of use on the body of an animal, and at least one fastener member comprising a clevis-shaped hasp and a flanged lever, said clevis-shaped hasp comprising a base having a central slot and a pair of inverted, generally U-shaped side walls laterally spaced thereon to form a channel transverse to the slot in the base, a notch formed in one side of said base adjacent the slot therein and communicating with said transverse channel, said flanged lever having a substantially rectangular body with inner and outer ends and planar surfaces, the inner end of said body having rounded shoulders extending laterally from the side edges thereof to seat within the U-shaped walls, said flanged lever having a rigid locking flange extending perpendicularly from one planar surface transversely of said lever, the inner end of said lever and said locking flange being insertable through the slot in the base and notch respectively so that the round shoulders are rotatably seated within said U-shaped walls whereby the outer end of said lever extends through said channel and the locking flange is directed toward said base so that on insertion of said opposite end portions in said channel between said lever and said base, said flanged lever is rotatable between a first position permitting free movement of said overlying opposite end portions and a second position in which said overlying opposite end portions are squeezed and bent by the locking flange on said lever against the base to secure the opposite end portions of said overlying encircling members together.

4,982,701

ANIMAL TETHERING DEVICE

Don J. Papak, 3478 Woodland, Windsor, Ontario, Canada N9E 1Z7

Filed Oct. 20, 1989, Ser. No. 424,866
Int. Cl.[5] A01K *3/00*
U.S. Cl. 119—121 **8 Claims**



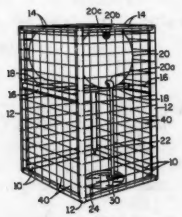
1. An animal tethering device comprising a tubular member having a pointed end, said tubular member having an annular collar affixed at an upper end portion thereof; an elongate, rod-like member of a size to fit within said tubular member and having a length less than the length of said tubular member; a rain cap affixed to an upper end portion of said rod-like member, said cap having an annular portion extending outwardly around said rod-like member and having a downwardly-extending flange at its outer edge, said flange having a diameter exceeding the outer diameter of said tube, the diameter of said flange not exceeding the diameter of an outer edge of said annular collar; and said rod-like member having ring means extending above the upper end thereof and above said cap to receive an end of a flexible member for restraining an animal.

4,982,702

GAME BIRD WETTING APPARATUS

Freddie C. Copps, Box 259, Dilley, Tex. 78017

Filed Aug. 31, 1989, Ser. No. 401,753
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—158 **2 Claims**



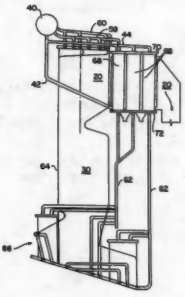
1. A game bird wing wetting apparatus comprising:
- a generally rectangular skeleton box frame formed by securement of bottom frame members to at least four vertical frame members;
- support means traversing the interior of said box frame at an elevation above the bottom frame members;
- an enclosed water container mounted on said support means;
- a closable fill opening in a top portion of said water container;
- a discharge opening in the bottom portion of said water container;
- a shallow pan recessed into the ground beneath said discharge opening;
- float controlled valve means disposed between said discharge opening and the interior of said shallow pan, said valve means being operable to maintainn a selected depth of water in said shallow pan;
- said shallow pan having a water containment area large enough to permit a game bird to enter said pan and wet the undersides of its body and wings; and
- a wire mesh fence enclosing the four sides and the top of said box frame, the size of said wire mesh being selected to permit only quail size birds to gain access to the water in said shallow pan.

4,982,703

UPFLOW/DOWNFLOW HEATED TUBE CIRCULATING SYSTEM

Melvin J. Albrecht, Homeworth, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 17, 1989, Ser. No. 422,853
Int. Cl.[5] F22B *37/10*
U.S. Cl. 122—6 A **10 Claims**



1. A fluid flow circuit for a boiler having a combustion chamber and an exhaust passage, comprising:
- a steam drum for separating steam from water;
- upper downcomer means connected to said steam drum for receiving water therefrom;
- at least one downflow convection pass wall enclosure circuit having an upper header and a lower header, positioned and partially defining said exhaust passage to absorb heat, said upper downcomer means being connected to said upper header to receive a portion of said water;
- riser means connected to said steam drum for returning a mixture of saturated steam and water to said steam drum;
- a lower downcomer connected to said convection pass wall enclosure circuit lower header; and
- at least one furnace circuit extending along the combustion chamber for receiving heat therefrom, and having a lower end connected to said lower downcomer and an upper end connected to said riser means.

4,982,704

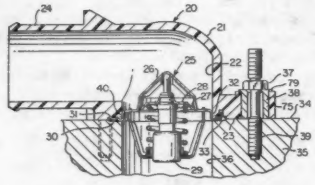
VEHICLE COOLING SYSTEM SUBASSEMBLY AND PARTS THEREFOR

Boyd P. Sliger, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 329,571, Mar. 28, 1989, Pat. No. 4,913,101. This application Jan. 12, 1990, Ser. No. 464,368
Int. Cl.[5] F01P *7/16*
U.S. Cl. 123—41.1 **27 Claims**

1. In a vehicle cooling system subassembly comprising an outlet housing having an opening therein, and a vehicle type

thermostat disposed in said opening of said outlet housing and having a housing means provided with a valve seat that is controlled by a movable valve member which is interconnected to a temperature responsive device that is carried by said housing means, said thermostat housing means being rotationally oriented in said opening of said outlet housing in a



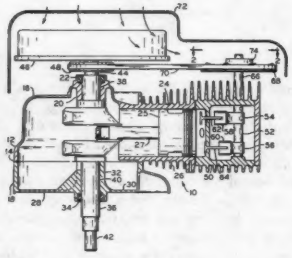
desired rotational position thereof, the improvement wherein said outlet housing has slot means therein and wherein said thermostat housing means has tab means extending outwardly therefrom and wedgingly disposed in said slot means to hold said thermostat in said opening of said outlet housing in said desired rotational position thereof.

4,982,705

CAM PULLEY AND CYLINDER HEAD ARRANGEMENT FOR AN OVERHEAD CAM ENGINE

Eric B. Hudson, Hilbert, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Feb. 21, 1990, Ser. No. 483,063
Int. Cl.[5] F01P *7/04*
U.S. Cl. 123—41.65 **13 Claims**



1. In an air-cooled internal combustion engine including a crankcase, a crankshaft disposed within said crankcase and extending externally of said crankcase, a cylinder extending from said crankcase and having a piston mounted for reciprocation therein and connected to said crankshaft, a cylinder head connected to said cylinder and including an overhead camshaft disposed therein, the camshaft extending externally of said cylinder head, a drive pulley mounted to said crankshaft externally of said crankcase, a cam pulley mounted to said camshaft externally of said cylinder head, drive means positively engaging said drive pulley and said cam pulley for transmitting rotary motion therebetween, and blower means driven by said crankshaft for drawing air in and blowing the air over said cylinder head, the improvement in combination therewith comprising:

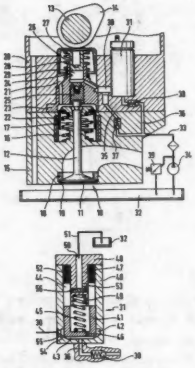
said cam pulley including means for directing air axially toward said cylinder head upon rotation of said cam pulley.

4,982,706

VALVE CONTROL APPARATUS HAVING A MAGNET VALVE FOR INTERNAL COMBUSTION ENGINES

Helmut Rembold, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1990, Ser. No. 548,406
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929073
Int. Cl.[5] F01L *1/12, 1/24;* F02D *13/02*
U.S. Cl. 123—90.12 **20 Claims**



1. A valve control apparatus for controlling the closing and opening time of an internal combustion engine motor valve actuated by a valve control cam of a camshaft via an axially displaceable valve shaft, having a fluid-filled stroke transmission chamber disposed in a housing block between the valve control cam and the valve shaft, a conduit in said housing block to said stroke transmission chamber for varying its effective axial length between the valve control cam and the valve shaft, a magnet valve for controlling fluid flow to and from said stroke transmission chamber, said conduit discharges at one end into a fluid reservoir, said fluid reservoir is embodied by a backward deflection of a valve element which serves as a reservoir piston in an opening direction, past a position uncovering a flow opening, into said magnet valve, said valve element, embodied as said reservoir piston **(41)**, is loaded by a reservoir spring **(45)** serving as a closing spring **(45)**, and a permanent magnet **(56)** is provided which keeps the valve element in an open position counter to the force of the closing spring when the magnet coil **(52)** is without an excitation current.

4,982,707

AUTOMOTIVE VEHICLE VIBRATION CONTROL ARRANGEMENT

Ryoichi Maeda, Fujisawa; Yuzo Kadomukai, and Makoto Yamakado, both of Shimoinayoshi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Hitachi, Ltd., Tokyo, both of, Japan

Filed Feb. 21, 1990, Ser. No. 482,958
Claims priority, application Japan, Feb. 27, 1989, 1-45718
Int. Cl.[5] F02B *75/06*
U.S. Cl. 123—192 B **8 Claims**

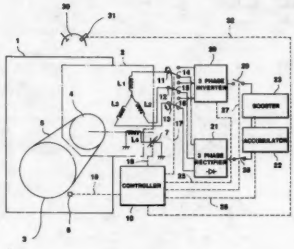
1. A vibration control arrangement for an automotive vehicle having an engine which includes a combustion chamber, comprising:

means for sensing the pressure in said combustion chamber;

means for monitoring the sensed pressure from the sensing means and determining if an improper combustion has occurred;

a device operatively connected with said engine to be driven thereby, said device placing a load on said engine;

control means responsive to said monitoring means for momentarily increasing the load placed on said engine by said device and thus varying the engine output torque, a predetermined time after the detection of an improper combustion.



4,982,708

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

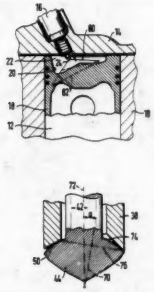
Heinz Stutzenberger, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 478,319

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920425

Int. Cl.[5] F02M *61/08, 57/06*

U.S. Cl. 123—297 **6 Claims**



1. A fuel injection nozzle for internal combustion engines, having a valve needle, a nozzle body (**38**) having an injection end, said nozzle body is provided with a central bore that receives and guides said valve needle, said central bore merges on a nozzle body face end toward the injection end with a wall face (**50**) that expands conically outward to form a valve seat (**76**), said valve needle including a closing head which closes against said wall face end, said closing head is pressed against the valve seat by a closing spring counter to a flow direction of an injection fuel delivered through said central bore, said conical wall face (**50**) forming the valve seat (**76**) is disposed on the nozzle body (**38**) on a center axis which is at an angle (a) to the longitudinal axis (**72**) of the valve needle (**42**) and said closing head (**44**) of the valve needle (**42**) includes a spherically curved sealing face (**74**) that cooperates with the valve seat (**76**) on the nozzle body (**38**) to form an emerging conical fuel injection stream (**80**).

4,982,709

APPARATUS FOR CONTROLLING THE IDLING SPEED OF ENGINE OPERABLE ON GASOLINE/ALCOHOL FUEL BLEND

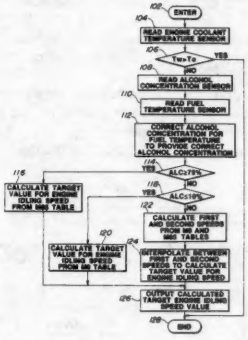
Tadaki Oota, Fujisawa, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Mar. 20, 1990, Ser. No. 495,970

Claims priority, application Japan, Mar. 28, 1989, 1-75860

Int. Cl.[5] F02D *41/16*

U.S. Cl. 123—339 **5 Claims**


ENTER
READ ENGINE COOLANT TEMPERATURE SENSOR
Tw>Tc
YES
NO
READ ALCOHOL CONCENTRATION SENSOR
READ FUEL TEMPERATURE SENSOR
CORRECT ALCOHOL CONCENTRATION FOR FUEL TEMPERATURE TO PROVIDE CORRECT ALCOHOL CONCENTRATION
ALC≥75%
ALC≤10%
CALCULATE TARGET VALUE FOR ENGINE IDLING SPEED FROM M6 TABLE
CALCULATE FIRST AND SECOND SPEEDS FROM M6 AND M60 TABLES
CALCULATE TARGET VALUE FOR ENGINE IDLING SPEED FROM M6 TABLE
INTERPOLATE BETWEEN FIRST AND SECOND SPEEDS TO CALCULATE TARGET VALUE FOR ENGINE IDLING SPEED
OUTPUT CALCULATED TARGET ENGINE IDLING SPEED VALUE
END

1. An apparatus for use with an internal combustion engine operable on either of gasoline fuel, alcohol fuel and gasoline-/alcohol fuel blend, comprising:

an alcohol concentration sensor sensitive to an alcohol concentration of the fuel to be delivered to the engine for producing an alcohol concentration signal indicative of a sensed alcohol concentration;

an oxygen sensor sensitive to an oxygen content of exhaust gases discharged from the engine for producing an air/fuel ratio feedback signal;

an engine coolant temperature sensor sensitive to an engine coolant temperature for producing an engine coolant temperature signal indicative of a sensed engine coolant temperature;

a control unit coupled to the alcohol-concentration, oxygen and engine-coolant-temperature sensors, the control unit including means responsive to the air/fuel ratio feedback signal for correcting the fuel supplied to the engine to maintain a desired air/fuel ratio when the sensed engine coolant temperature exceeds a predetermined value, the control unit including means responsive to an idle engine condition for calculating a target value for engine speed as a function of alcohol concentration and engine coolant temperature when the coolant temperature is below the predetermined value; and

means coupled to the control unit for adjusting the engine speed at the calculated target value.

4,982,710

ELECTRONIC THROTTLE VALVE OPENING CONTROL METHOD AND SYSTEM THEREFOR

Kenji Ohta, Katsuta; Shigeru Horikoshi, Mito, and Hayato Sugawara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ibaraki, both of, Japan

Filed Nov. 1, 1989, Ser. No. 430,015

Claims priority, application Japan, Nov. 7, 1988, 63-279341

Int. Cl.[5] F02D *7/00*

U.S. Cl. 123—399 **8 Claims**

1. An electronic throttle valve opening degree control system having a DC motor for adjusting the opening of a throttle valve in response to a difference between a target value of

throttle valve opening degree and a detected value of throttle valve opening degree, comprising:

target opening calculating means for generating a value representing a target throttle valve opening degree;

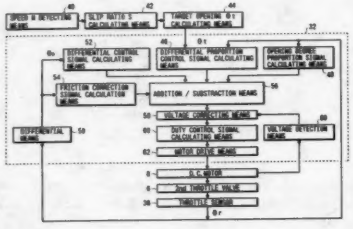
differential proportion control signal calculating means for generating a first control signal proportional to the difference between the value of said target throttle valve opening degree and a detected value representing actual throttle valve opening degree;

opening degree proportional signal calculating means for generating an opening degree proportional signal in response to the detected value of actual throttle valve opening degree;

differential means for differentiating the value of said actual throttle valve opening degree to generate a throttle valve opening differentiated value;

differential control signal calculating means for generating a second control signal in response to the throttle valve opening differentiated value;

friction correction signal calculating means for generating a



friction correction signal in response to the throttle valve opening differentiated value generated by said differential means;

addition-subtraction means for performing a predetermined calculation using the output signals from the differential proportion control signal calculating means, the opening degree proportion signal calculating means, the differential control signal calculating means, and the friction correction signal calculating means;

voltage detection means for detecting the voltage of said DC motor;

voltage correcting means for correcting the result of said predetermined calculation by the addition-subtraction means in response to the DC motor voltage detected by the voltage detection means;

duty control signal calculating means for generating a duty signal for control of the DC motor in response to the output of the voltage correcting means; and

motor drive means for controlling the DC motor to control the opening of the throttle valve in response to the duty signal of the duty control signal calculating means.

4,982,711

APPARATUS FOR ACTUATING A THROTTLE VALVE IN INTERNAL COMBUSTION ENGINES

Karl Gmelin, Flein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

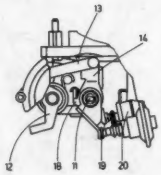
Filed Feb. 12, 1990, Ser. No. 478,395

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905675

Int. Cl.[5] F02D *7/00*

U.S. Cl. 123—399 **16 Claims**

1. An apparatus for actuating a throttle valve secured on a throttle valve shaft in internal combustion engines, having an adjusting lever seated on the throttle valve shaft in a manner fixed against relative rotation, a carrier on a pivot lever, the adjusting lever being actuatable on the one hand by said carrier on said pivot lever rotatably seated with a bush on a split taper socket (16) secured for rotation with the throttle valve shaft, and on the other hand by an electromotive throttle valve adjuster, and having a cylindrical decoupling spring embodied as a torsion spring which is disposed on a spring guide sleeve split in two transversely to the axial direction and encompassing the pivot lever bush, said decoupling spring is braced with



its tangentially protruding spring ends on the adjusting lever and pivot lever, for restoration of the adjusting lever upon actuation by the throttle valve adjuster, the split taper socket (16) protrudes axially out of said pivot lever bush (15), and one sleeve part (23) of the spring guide sleeve (22) is secured to the split taper socket (16) in the protruding region.

4,982,712

IGNITION TIMING CONTROL SYSTEM FOR AN ENGINE

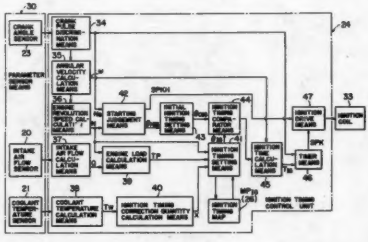
Kunihiro Abe, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,277

Claims priority, application Japan, Jul. 21, 1988, 63-182200

Int. Cl.[5] F02P *5/15*

U.S. Cl. 123—424 **12 Claims**



1. An ignition timing control system for an engine having a crank angle sensor for detecting a rotation angle of a crank shaft in order to obtain an engine speed, an intake air flow sensor, a coolant temperature sensor, angular velocity calculation means responsive to the crank angle sensor and engine load calculation means responsive to the intake air flow sensor and the angular velocity calculation means, comprising:

starting judgement means responsive to said crank angle sensor for determining a starting state of the engine,

ignition timing setting means responsive to said angular velocity calculation means, engine load calculation means and intake air flow sensor, for setting the ignition timing from an engine map stored in a memory by using an engine load and the engine speed as parameters, respectively, and

initial ignition timing setting means responsive to the engine speed and said angular velocity calculation means, for gradually advancing an ignition timing from a fixed ignition timing to a predetermined ignition timing set by the ignition timing setting means immediately after it is deter-

mined by said starting judgement means that said engine is in a starting state.

4,982,713

UNIT FUEL INJECTOR INCLUDING A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

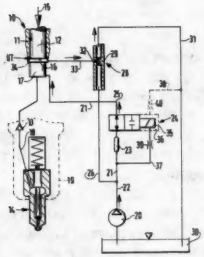
Dominique Buisson, Venissieux, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 542,136

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1989, 3924127

Int. Cl.[5] F02M *41/00*

U.S. Cl. 123—467 6 Claims



1. An electrically controlled fuel injection pump (10) for internal combustion engines, in particular a unit fuel injector for fuel injection in Diesel engines, having at least one pump piston (12), driven at a constant stroke, which defines a pump work chamber (17) and in a supply stroke pumps the fuel, supplied to this pump work chamber (17) at inflow pressure by a feed pump (20), to an injection nozzle (14) at injection pressure; having an electrically actuatable control valve (24), which is inserted between a flow segment (22) containing a low-pressure chamber (23) and a flow conduit (25), said control valve (24) communicating continuously with the pump work chamber (17), of a flow line (21), and by means of which an otherwise open communication for filling of the pump work chamber (17) between the flow segment (22) and the flow conduit (25) is blockable in order to control the duration of fuel injection; a connecting conduit (33), connected to the pump work chamber (17) and opened by the pump piston 12 only in a bottom dead center position (UT) of said pump piston, the connecting conduit being located and connected between the pump work chamber (17) and a return line (31) which carries excess fuel back to the tank (30), a venturi pump (28), said connecting conduit (33) and said return line (31) communicate via said venturi pump (28) which acts as a jet pump, said venturi pump connected on its inflow side, via a connecting segment (26), which connects to the flow segment (22) of the flow line (21), and on its outflow side to the return line (31), and connected on the intake side to the pump work chamber (17), via the connecting conduit (33).

4,982,714

AIR-FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

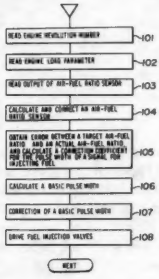
Toshihisa Takahashi; Masanobu Uchinami; Shinichi Nishida, all of Himeji, and Hitoshi Inoue, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 227,561, Aug. 3, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 515,524

Claims priority, application Japan, Aug. 19, 1987, 62-126904[U]

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—488 4 Claims


READ ENGINE REVOLUTION NUMBER
101
READ ENGINE LOAD PARAMETER
102
READ OUTPUT OF AIR-FUEL RATIO SENSOR
103
CALCULATE AND CORRECT AIR-FUEL RATIO SENSOR
104
OBTAIN ERROR BETWEEN A TARGET AIR-FUEL RATIO AND AN ACTUAL AIR-FUEL RATIO AND CALCULATE A CORRECTION COEFFICIENT FOR THE PULSE WIDTH OF A SIGNAL FOR INJECTING FUEL
105
CALCULATE A BASIC PULSE WIDTH
106
CORRECTION OF A BASIC PULSE WIDTH
107
DRIVE FUEL INJECTION VALVES
108
NEXT

1. An air-fuel ratio control apparatus for an internal combustion engine comprising:

an air-fuel ratio sensor to detect an air-fuel ratio in response to specified components contained in an exhaust gas; and

an electronic control section which receives a signal from said air-fuel ratio sensor to calculate an amount of fuel to be injected from a fuel supplying device so that the air-fuel ratio of a gas mixture to be supplied to the engine approaches a target air-fuel ratio;

correction coefficient means for permanently storing predetermined correction coefficients on a basis of values of a parameter of the load and the engine revolution number, said predetermined correction coefficients being usable for correcting at least one of the output of said air-fuel ratio sensor and an air-fuel ratio information;

data obtaining means for obtaining a parameter of a load for said engine and an engine revolution number by detecting means, and obtaining a correction coefficient from said correction coefficient means on the basis of the parameter of the load and the engine revolution number;

correcting means for using said obtained correction coefficient to correct at least one of the output of said air-fuel ratio sensor and an air-fuel ratio information obtained by the output of said air-fuel ratio sensor.

4,982,715

SUPPLEMENTAL FUEL VAPOR SYSTEM

Paul M. Foster, 1209 Turner St., P.O. Box 1693, Ashland, Ky. 41101

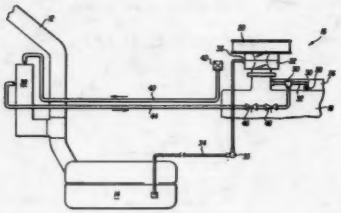
Filed May 15, 1987, Ser. No. 51,247

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—518 3 Claims

1. A supplemental fuel system utilizing fuel vapor, comprising: an internal combustion engine including a carburetor and an intake manifold; a fuel tank provided with air vents; a fuel conduit having a first end connected to said fuel tank and in communication with liquid fuel in said tank and a second end connected to said carburetor; said fuel conduit delivering said liquid fuel to said carburetor from said fuel tank; a fuel vapor conduit having a first end connected to said fuel tank at a location displaced from contact with said liquid fuel and a second end connected to a carbon canister; a PCV conduit

having a first end connected to a pollution control valve and a second end connected to said intake manifold; and, an intermediate fuel vapor conduit having a first end connected to said fuel vapor conduit and a second end connected to said PCV conduit; wherein said air vents continuously provide air to said tank to mix with said liquid fuel and form fuel vapor, said fuel



vapor drawn from said fuel tank by vacuum developed in said intake manifold and flows through said fuel vapor conduit, said intermediate fuel vapor conduit and said intake manifold to combustion chambers of said internal combustion engine so as to supplement fuel delivered to said engine by said fuel conduit, said liquid fuel and said fuel vapor constantly delivered to said engine during normal operation.

4,982,716

FUEL INJECTION VALVE WITH AN AIR ASSIST ADAPTER FOR AN INTERNAL COMBUSTION ENGINE

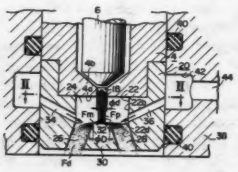
Keiso Takeda, Mishima; Taiyo Kawai, Susono; Kiyoshi Nakanishi, Suson; Michiaki Ujihashi, Mishima, and Yuichi Takano, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 14, 1989, Ser. No. 309,862

Claims priority, application Japan, Feb. 19, 1988, 63-19874[U]

Int. Cl.[5] F02M *23/00*

U.S. Cl. 123—531 **13 Claims**



1. A fuel injection value with an air assist adapter for internal combustion engine comprising:

an injector body having a fuel injection hole for injecting fuel in a slug-like pattern; and

an adapter coaxially coupled to the injector body, the adapter including:

a recessed concave portion for defining a dead volume portion therein such that fuel injected from the fuel injection hole flows in a slug-like pattern from the fuel injection hole into the dead volume portion;

a fuel collision surface, spaced from and axially opposite to the fuel injection hole, for allowing fuel flowing from the fuel injection hole toward the fuel collision surface to collide with the fuel collision surface to thereby change the fuel flow direction from a first direction toward the fuel collision surface to a second direction away from an axis of the adapter and to change the fuel flow pattern from the slug-like pattern to a membrane-like pattern;

means, formed in the adapter, for injecting air against the membrane-like pattern of fuel from above the membrane-like pattern of fuel in a direction opposite the second direction to thereby assist in atomization of the fuel, the air injecting means comprising two air injection holes; and

two injected fuel paths, formed on sides of the fuel collision surface, for conducting the atomized fuel and the injected air into an intake port of an engine, each fuel path having one end lying in a plane including the fuel collision surface.

4,982,717

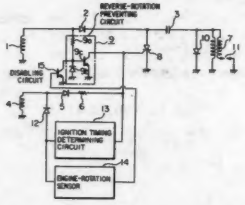
IGNITION SYSTEM FOR AN ENGINE WITH A REVERSE-ROTATION PREVENTING FUNCTION

Hiroshi Okuda, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1990, Ser. No. 493,660

Int. Cl.[5] F02P *11/00*

U.S. Cl. 123—603 **5 Claims**



1. An ignition system for an engine with a reverse-rotation preventing function, said ignition system comprising:

a generator coil for generating an alternating current output in synchronism with the rotation of the engine;

an ignition circuit connected to receive the alternating current output of said generator coil for producing a high voltage for ignition;

a reverse-rotation preventing circuit operable in response to the output of a predetermined polarity of said generator coil to prevent the operation of said ignition circuit as long as the predetermined polarity of the generator output remains unchanged;

an engine-rotation sensing circuit for sensing the number of revolutions per minute of the engine; and

a disabling circuit for disabling said reverse-rotation preventing circuit when the number of revolutions per minute of the engine as sensed by said engine-rotation sensing circuit exceeds a predetermined level.

4,982,718

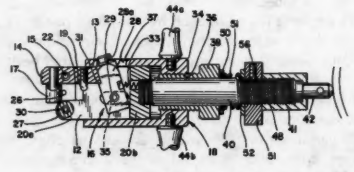
ARROW RELEASE

Harry Hamm, and Brian Hamm, both of 6210 Wintergreen Dr., Wisconsin Rapids, Wis. 54494

Filed May 24, 1989, Ser. No. 356,551

Int. Cl.[5] F41B *5/18*

U.S. Cl. 124—35.2 **8 Claims**



1. A bow string release, comprising:

(a) a generally barrel-shaped body member having an opening at one end for receiving the bow string and having an

opposite end which is adapted to be carried by the palm of the human hand;

(b) a sear for releasably holding the bow string in said body member, said sear being carried at said one end by said body member for pivotal movement at generally right angles to the direction of movement of the bow string, said sear having a released position wherein the bow string is free to move out of said opening at said one end of said body member and having a captured position wherein the bow string is held within said body member;

(c) a latch for releasably holding said sear in said captured position, said latch including a latch member which has two opposite ends, one end of said latch member being pivotally connected to said body member for pivotal movement at generally right angles to the direction of movement of the bow string, said latch member having a disengaged position and having an engaged position wherein said sear is restrained from pivotal movement, said latch including biasing means for biasing said latch member in said engaged position; and

(d) operating means, slideably carried around said body member for movement intermediate said ends of said body member, for overcoming said biasing means and moving said latch member from said engaged position to said disengaged position to free said sear for pivotal movement from said captured position to said released position, said operating means including:

engaging means for engaging said opposite end of said latch member when said operating means is moved in one direction relative to the ends of said body member; and

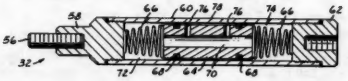
position adjusting means for changing the distance said operating means moves in said one direction before said engaging means engages said latch member.

4,982,719

HYDRAULIC BOW STABILIZER

Alan J. Haggard, Holly, and Christopher A. Young, Howell, both of Mich., assignors to Ace Archers, Inc., Holly, Mich.

Filed Jan. 12, 1990, Ser. No. 464,276
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—89 **12 Claims**



1. A bow comprising:

a handle and a string;

a hydraulic stabilizer connected to said handle, said hydraulic stabilizer having a axially extending cylinder defining two piston therein, said piston being movable axially within said cylinder, first and second hydraulic chambers being defined between each axial end of said cylinder and said piston and containing hydraulic fluid;

a passage formed at a central portion of said piston and interconnecting said first and second hydraulic chambers, and means for preventing flow of said hydraulic fluid between said first and second chambers at an outer periphery of said piston.

4,982,720

CUTTING SAW BLADE

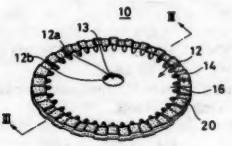
Yusaku Matsuda, Osaka, Japan, assignor to Sanwa Diamond Industrial Co., Ltd., Japan

Filed Apr. 13, 1989, Ser. No. 337,631
Int. Cl.[5] B28D *1/04*
U.S. Cl. 125—15 **10 Claims**

1. A cutting saw, comprising:

a cutting saw plate including a first thin circular plate and a second thin circular plate, said first thin plate and said second thin plate being overlaid on each other and being bonded to each other, said cutting saw plate having a periphery; and

a sinter formed around said periphery of said cutting saw plate, said sinter comprising two circular pressed powder masses overlaid on each other, said pressed powder masses each including abrasive, said sinter being formed



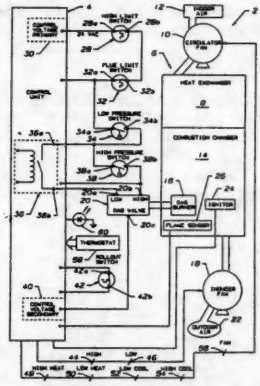
with a zigzag shape in the direction of its thickness by the uniting of said powder masses by heating and pressing on both sides of said powder masses while said powder masses surround said periphery of said cutting saw plate, said sinter including a seam between said pressed powder masses that is zigzag shaped in the direction of thickness of the plate.

4,982,721

RESTRICTED INTAKE COMPENSATION METHOD FOR A TWO STAGE FURNACE

Gregory A. Lynch, Murfreesboro, Tenn., assignor to Inter-City Products Corp. (USA), Lavergne, Tenn.

Filed Feb. 9, 1990, Ser. No. 477,743
Int. Cl.[5] F24H *3/00*
U.S. Cl. 126—116 A **4 Claims**



1. In a two stage furnace including a plenum, a gas burner, a gas valve having a low and high combustion operating setting, and an inducer fan having a low and high speed operating setting, a method of compensating for a restricted intake condition comprising the steps of:

providing a low and high pressure switch for determining if the air pressure inside the plenum indicates sufficient air is present for the gas burner to support low and high combustion, respectively;

operating the furnace at high combustion when high heat is enabled by operating the inducer fan at the high speed setting;

determining the state of said high pressure switch during high combustion including timing the duration of the stat changes of said high pressure switch;

switching the inducer fan to the low speed setting when said

high pressure switch has indicated that insufficient air was present to support high combustion for a predetermined time period;

determining the state of said low pressure switch during low combustion;

switching the inducer fan to the high speed setting when the low pressure switch indicates that insufficient air is present to support low combustion.

4,982,722

HEAT RETENTIVE SERVER WITH PHASE CHANGE CORE

W. Burk Wyatt, Brentwood, Tenn., assignor to Aladdin Synergetics, Inc., Nashville, Tenn.

Filed Jun. 6, 1989, Ser. No. 361,943

Int. Cl.[5] F24J 2/40

U.S. Cl. 126—400 59 Claims

1. A server base for use in a heat retentive server to maintain food or beverage in a desired temperature range for a period of time, said server base comprising:

an upper shell and a lower shell, said shells sealing a cavity formed therebetween; and

a heat retention member disposed in said cavity, said heat retention member comprising an encapsulated heat retention medium, said medium being meltable to store heat therein when heated toward and above its melting point, and to release heat through said upper shell to maintain food or beverage supported above said upper shell warm as said melted heat retention material solidifies.

4,982,723

ACCUMULATOR ARRANGEMENT FOR THE SUNLIGHT ENERGY

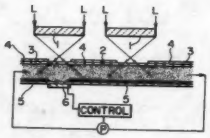
Kei Mori, No. 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Nov. 3, 1983, Ser. No. 548,427

Claims priority, application Japan, Nov. 10, 1982, 57-197135; Nov. 15, 1982, 57-200229

Int. Cl.[5] F24J 2/08

U.S. Cl. 126—440 5 Claims



1. A solar energy accumulator arrangement comprising a transparent conduit defining a fluid passage; an induction substance flowing through said fluid passage at a flow rate responsive to the intensity of sunlight, said induction substance being of a type which transforms to a higher energy level by a photochemical reaction to thereby accumulate solar energy from the light component thereof, whereby when the energy level of said induction substance returns to its original state, said energy is emitted as heat; a plurality of optical systems disposed to focus the sunlight onto said fluid passage to increase the intensity of said sunlight, said optical system focusing said sunlight sufficiently to transform said induction substance to a higher energy level by a photochemical reaction; and a solar cell disposed on the outer surface of a part of said fluid passage outside of said vicinity of said focal points.

4,982,724

ENDOSCOPE APPARATUS

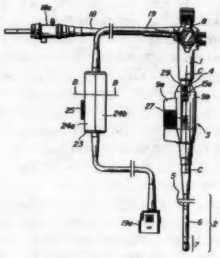
Yoshitake Saito, Kunitachi, and Kenji Hirooka, Hachioji, both of, Japan, assignors to Olympus Opicals Co., Japan

Filed Dec. 19, 1988, Ser. No. 286,149

Claims priority, application Japan, Dec. 28, 1987, 62-330291; Jan. 26, 1988, 63-7573

Int. Cl.[5] A61B 8/12, 1/00

U.S. Cl. 128—4 6 Claims



1. An endoscope apparatus for observing an inside of a cavity comprising:

an inserting portion insertable in a cavity under inspection and having distal and proximal ends;

an operating means having one end connected to said proximal end of said inserting portion;

a forceps channel formed within the inserting portion to extend from said distal end to said proximal end and having a forceps opening formed in said operating means;

a first conduit means arranged within said inserting portion;

a suction source means for connection to one of said first conduit means and said forceps channel;

a second conduit means provided in said operating means and having one end connected to said forceps channel at a point near said forceps opening and another end connected to said suction source means;

a switching means arranged in said second conduit means for selectively alternately connecting one of said forceps channel and said first conduit means to said suction source means, regardless of whether a forceps is inserted into said forceps channel.

4,982,725

ENDOSCOPE APPARATUS

Hiroki Hibino; Yoshikatsu Nagayama; Mutsumi Yoshikawa, all of Hachioji; Toshiyuki Takara, Higashimurayama; Masahito Goto; Akira Suzuki, both of Hachioji; Sakae Takehana, Machida; Yoshinao Oaki, Hachioji; Koichi Yoshimitsu, Hachioji, and Yoshisada Aoki, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,216

Claims priority, application Japan, Jul. 4, 1989, 1-173604; Sep. 5, 1989, 1-230234; Mar. 30, 1990, 2-86178

Int. Cl.[5] A61B 1/00

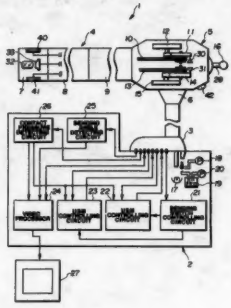
U.S. Cl. 128—4 38 Claims

1. An endoscope apparatus comprising:

an endoscope having an elongate insertable part having a bendable part and a driving means for bending and driving said bendable part;

a first bending controlling means for controlling said driving means; and

a second bending controlling means for controlling said driving means independently of said first bending controlling means when said first bending controlling means is controllable.

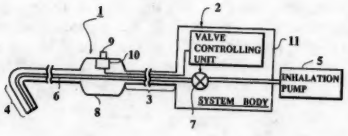


4,982,726

ELECTRONIC ENDOSCOPE SYSTEM WITH SUCTION CHANNEL OF CONTROLLABLE STRENGTH OF SUCTION

Daijiro Taira, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1990, Ser. No. 510,243
Claims priority, application Japan, Apr. 20, 1989, 1-98853
Int. Cl.[5] A61B 1/00
U.S. Cl. 128—4 6 Claims



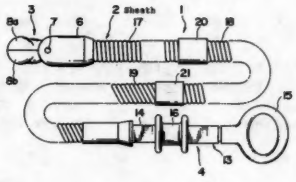
1. An electronic endoscope system, comprising:
a scope section having an end portion;
suction pump means for providing a power for inhalation;
suction channel means for providing a path for inhalation by the suction pump means from the end portion of the scope section;
suction switch means to be pressed by an operator for indicating a desired strength of inhalation through the suction channel means by an extent of depression;
sensor means for detecting the extent of depression of the suction switch means;
pinching valve means, located on the suction channel means between the end portion of the scope section and the suction pump means, for adjusting a strength of inhalation through the suction channel means by adjustably changing an extent of opening; and
means for controlling the strength of inhalation through the suction channel means to the desired strength of inhalation through the suction channel means indicated by the suction switch means, by adjusting the extent of opening of the pinching valve means in accordance with the extent of depression of the suction switch means detected by the sensor means.

4,982,727

ENDOSCOPIC TREATING INSTRUMENT

Yukio Sato, Kodaira, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1990, Ser. No. 509,634
Claims priority, application Japan, Apr. 13, 1989, 1-143272[U]; Sep. 22, 1989, 1-1247694
Int. Cl.[5] A61B 1/00
U.S. Cl. 128—4 12 Claims



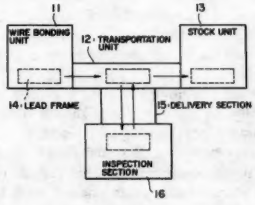
1. An endoscopic treating instrument comprising a coil sheath having a treating portion at a distal end of the coil sheath, the coil sheath comprising:
a distal coil portion formed by a single wire,
a proximal coil portion formed by a plurality of wires, the proximal coil portion being harder than the distal coil portion, and
an intermediate coil portion between the distal and proximal coil portions, the intermediate coil portion being of an intermediate hardness between the hardness of the distal and proximal coil portions.

4,982,728

APPARATUS FOR ASSEMBLING SEMICONDUCTOR DEVICES

Hisao Masuda; Hitoshi Fujimoto, and Shuichi Osaka, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 4, 1990, Ser. No. 461,070
Claims priority, application Japan, Jul. 7, 1989, 1-174174
Int. Cl.[5] H01L 21/58, 21/60
U.S. Cl. 228—4.5 8 Claims



1. An apparatus for assembling semiconductor devices comprising:
working means for processing partially fabricated articles from which semiconductor devices are being made;
a transportation line for transporting the partially fabricated articles from said working means;
checking means disposed outside said transportation line for checking articles processed by said working means for defects; and
delivery means for selectively extracting from and returning to said transportation line a sample comprising less than one hundred percent of the articles processed by said working means, said delivery means moving the articles extracted from said transportation line to said checking

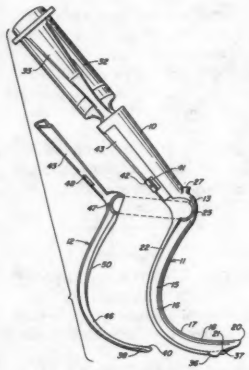
means and returning the extracted articles to said transportation line from said checking means after checking for defects.

4,982,729

RIGID FIBEROPTIC INTUBATING LARYNGOSCOPE

Tzu-Lang Wu, 1522 Blackfoot Dr., Fremont, Calif. 94539

Continuation-in-part of Ser. No. 308,526, Feb. 10, 1989, abandoned. This application Dec. 8, 1989, Ser. No. 447,611
Int. Cl.[5] A61B *1/26*
U.S. Cl. 128—11 4 Claims



1. A laryngoscope comprising:

a handle;

a blade connected to said handle, said blade having a substantially straight portion connected to said handle, an arcuate midportion, a substantially straight distal position terminating at a distal end, a first groove running the length of said blade and opening on the convex side of said arcuate midportion;

a bivalve element having an arcuate portion, a distal end, and substantially straight portions shaped to register with corresponding portions of said blade, a second groove running the length of said arcuate portion, said blade and said bivalve element connectable together with corresponding shaped portions in contact such that said first groove and said second groove form an elongated passageway running substantially from the connection between said blade and said handle to the distal end of said blade;

first interlocking means located at the distal end of said blade;

second interlocking means located at the distal end of said bivalve element, said first and second interlocking means being positionable to form a releasable interlock when brought into contact with each other;

holding means to releasably connect said bivalve element to said handle, and

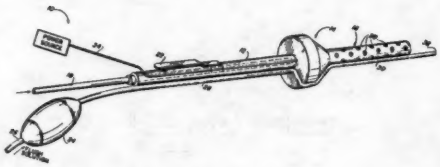
an opening into said elongated channel formed between cooperating elements of said blade and said bivalve element.

4,982,730

ULTRASONIC WOUND CLEANING METHOD AND APPARATUS

Royce C. Lewis, Jr., 5233 19th St., Lubbock, Tex. 79407

Filed Dec. 21, 1988, Ser. No. 289,361
Int. Cl.[5] A61B *17/00*
U.S. Cl. 128—24 A 8 Claims



1. An ultrasonic wound cleaning device comprising:

an annular ultrasonic transducer having an axial bore extending therethrough;

means for energizing said transducer to generate ultrasonic energy;

a handle connected to one side of said transducer;

a collecting cone having a base and an apex, said base being connected to the other side of said transducer;

a cleaning applicator having upstream and downstream ends, said upstream end being removably connected to said apex of said collecting cone;

said cleaning applicator being an elongated tubular member adapted to be extended into the open passageway of a wound and having perforations along the length of the downstream end; and

means for providing flow of cleaning liquid through said axial bore of said transducer whereupon said cleaning liquid is subjected to ultrasonic energy and caused to cavitate, and then flow into the collecting cone, into the cleaning applicator, through the perforations of said cleaning applicator, and into the wound; the cleaning liquid releasing ultrasonic energy into the wound thereby cleaning the wound of unwanted matter.

4,982,731

IMPLANTABLE SYSTEM AND METHOD FOR AUGMENTING PENILE ERECTION

Tom F. Lue, Millbrae; Emil E. Tanagho; Richard A. Schmidt, both of San Rafael, and Curtis A. Gleason, Palo Alto, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 26, 1988, Ser. No. 262,890
Int. Cl.[5] A61F *2/26*
U.S. Cl. 128—79 19 Claims

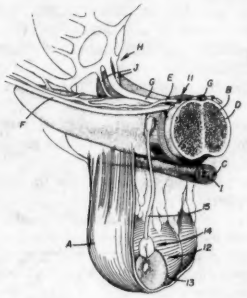
1. A method of augmenting penile erection in a human male comprising the steps of

identifying the corpora cavernosa, corpus spongiosum, tunica albuginea corporum cavernosorum, dorsal artery, dorsal nerve, cavernous veins, the suspensory ligament attached to the root of a penis and deep dorsal vein adjacent to the hilum and root of the penis,

placing compression means proximal to said suspensory ligament and at least around said corpora cavernosa, cavrnous veins, and deep dorsal vein, adjacent to said hilum, outside said tunica albuginea corporum cavernosorum, and under said dorsal artery and dorsal nerve,

selectively compressing said compression means to apply pressure against said corpora cavernosa, cavernous veins, and deep dorsal vein to restrict venous flow of blood

therethrough and to augment erection of said penis for a predetermined time period, and



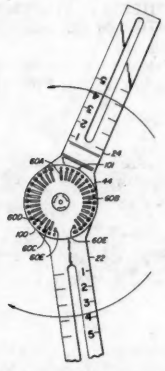
removing said pressure from said corpora cavernosa and said deep dorsal vein, after said predetermined time period has elapsed, to re-establish said venous flow of blood.

4,982,732

ORTHOPEDIC REHABILITATION KNEE BRACE

John C. Morris, Castro Valley, Calif., assignor to Orthopedic Technology, Inc., San Leandro, Calif.

Filed Feb. 6, 1990, Ser. No. 475,571
Int. Cl.[5] A61F *3/00*
U.S. Cl 128—80 C **18 Claims**



9. A knee brace for the adjustable restraint of a knee comprising in combination a thigh strut for attachment to the thigh above the knee;

a calf-strut for attachment to the calf above the knee;

wing means for attachment to said thigh and thigh strut whereby said thigh strut is constrained for movement with the thigh of a wearer;

wing means for attachment to said calf whereby said calf-strut is confined to said calf for movement with the leg of said wearer;

said thigh-strut and calfstrut adjustable with respect to said thigh means and calf means for coinciding respective ends of said strut at the knee of the leg of a wearer;

a hinge for disposition adjacent the knee of a wearer, said hinge including:

a first hinge member for attachment to said thigh strut for rotation with said thigh strut;

a second hinge member for attachment to said calf strut for rotation with said calf strut;

said first and second hinge members configured for relative rotating engagement one with respect to another to permit said knee brace to flex between a flexion and extension limits of knee movement while reinforcing a braced knee through said thigh strut and thigh wings and said calf strut and calf wings;

one of said hinge members defining an annular cam with respective extension limits and flexion limits for enabling said hinge to be restricted in relative rotation in flexion and extension by stops interior of said cam engaging said respective cam limits;

a plurality of individual radially aligned stops, said stops each having a manipulation portion;

the other of said hinge members defining radially aligned stop ways for permitting toggling movement of said stops with respect to said annular cam between a radially engaged position with respect to said cam limits and a radially disengaged position with respect to said cam limits;

spring means acting between said hinge members and stops for permitting toggling movement and maintaining position of said stops radially of said hinge between positions engaged to said cam and positions disengaged from said cam; and

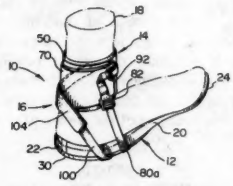
locking means acting on said stops for locking said stops with respect to said hinge members to maintain the position of said stop with respect to said hinge member whereby movement of said hinge is restricted.

4,982,733

S T S (SUB-TALAR STABILIZER) ANKLE BRACE

Christopher M. Broadhurst, and Peter J. Charbonneau, both of Oakville, Canada, assignors to Finlayson & Singlehurst, Canada

Filed May 17, 1989, Ser. No. 352,899
Int. Cl.[5] A61F *3/00*
U.S. Cl. 128—804 **9 Claims**



1. An ankle orthosis comprising:

a foot section, a cuff, a first and second flexible, non-elastic strap means;

said foot section, having a heel portion including means by which an end of each said strap means may be connected thereto;

said cuff having fastening means for attaching the cuff around and over an ankle portion of a lower leg;

said first strap means having one end connected to a forward, lateral part of said heel portion such that in use said one end is generally at or just forward of the base of the fifth metatarsal head of a user's foot, the other end of the first strap means being secured to said cuff such that when the cuff is in operative association with an ankle, said first strap means substantially crosses over the anterior talo fibular ligament of the ankle and the other end of said first strap means is secured to said cuff slightly anterior of the fibular head of the user's ankle; means for selectively adjusting tension in said first strap means;

said second strap means having one end connected to said heel portion rearward of the connection of said first strap means therewith, and generally in line with the inferior pole of the distal fibular bone of the user's foot, said sec-

ond strap means being of a length whereby said second strap means can be wrapped around and over the Achilles tendon of the ankle and at least a part of the medial portion of the ankle; and means for detachably securing the other end of said second strap means to said cuff forward of the medial portion of the ankle when said cuff is in operative association therewith.

4,982,734

ANAESTHESIA EQUIPMENT

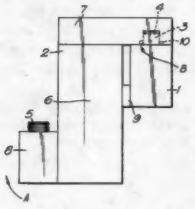
Alan C. Green, Oxford, and Richard Eeles, Bampton, both of England, assignors to Penlon Limited, United Kingdom

Filed May 3, 1989, Ser. No. 346,795

Claims priority, application United Kingdom, May 7, 1988, 8810873

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—200.14 9 Claims



1. Anaesthesia equipment comprising a mounting rack, an anaesthesia unit detachably mounted on said rack, connecting means comprising two mating elements, one associated with a first surface of the rack and the other with a first surface of the unit, enabling the unit to be mounted on the rack and connected to a fluid supply associated with the rack, the two said first surfaces facing one another when the unit is mounted on the rack, and guide means located between a second surface of the rack and a second surface of the unit when the unit is mounted on the rack, the guide means being associated with at least one of the rack and the unit to provide substantially accurate leak-free engagement of said mating elements said second surfaces of the rack and unit being substantially perpendicular to the first surfaces of the rack and unit respectively.

4,982,735

ARTIFICIAL VENTILATOR

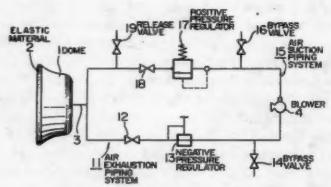
Kazuhiko Yagata, Kanagawa, and Yasuo Noguchi, Yokohama, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 274,122

Claims priority, application Japan, Mar. 1, 1988, 63-45941

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—204.23 10 Claims



1. An artificial ventilator comprising:

a dome made of hard material, said dome having an opening at the apex thereof for connection to an air duct and a fitting made of elastic material at the bottom periphery thereof;

a blower adapted to be connected to said air duct for sucking and exhausting air in said dome;

an air suction duct and an air exhaustion duct adapted to connect said dome and said blower together;

a negative pressure regulator mounted on an exhaustion piping system;

a positive pressure regulator mounted on a suction piping system;

a pressure sensor for detecting a pressure within said dome;

an exhaustion valve and a suction valve for controlling air exhaustion and suction;

a release valve for releasing a negative or positive pressure into atmospheric air;

a bypass valve for bypassing air when said air exhaustion valve or said air suction valve is closed;

a valve switching device for controlling to open and close said air exhaustion valve, air suction valve, release valve and bypass valve; and

a respiration detection system comprising a respiratory sensor including a pyroelectric element mounted at a passage of respiration air or near narises of a patient for detecting a temperature change rate at said passage or near said narises, and a respiration detection circuit for comparing a temperature change rate signal obtained by said pyroelectric element with a threshold value set at a variable resistor, detecting start timings of air expiration and air inspiration in accordance with the comparison result, and outputting a timing signal, said respiration detection system thereby controlling said valve switching device.

4,982,736

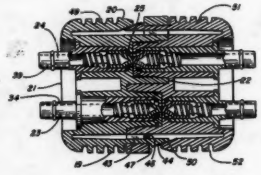
HERMAPHRODITIC COUPLING FOR ANATOMICAL THERMAL SYSTEM

Barry L. Schneider, Deerfield, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Feb. 8, 1989, Ser. No. 308,312

Int. Cl.[5] A61F *7/00*; F16K *51/00*

U.S. Cl. 128—400 11 Claims



1. An element for a hermaphroditic type connector comprising a generally rectangular body defined by the top and bottom walls, a pair of end walls,

a pair of longitudinally-extending lumens extending through said body from one end wall to the other, one each adjacent a sidewall,

one of said end walls being equipped with coupling means aligned with said lumens for coupling the same to tubing means,

the other of said end walls being equipped with a step between said lumens and defining first and second portions in said other end wall,

said first portion of said other end wall being closer to said one end wall than said second portion,

a hollow integral projection on said first portion and extending longitudinally away from said one end wall and aligned with a first of said lumens and providing a continuation of the same, and

a longitudinally extending recess in said second portion aligned with the second of said lumens and providing a continuation of the same, said recess having an interior

conforming to the exterior of said projection whereby an identical second element is adapted to be connected to said body,

each lumen being equipped with a check valve openable by the connection of said second element to said body.

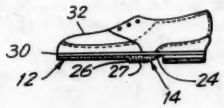
9. An anatomical thermal system comprising pad means adapted to be positioned on the body of a patient and equipped with internal conduit for passage of thermal fluid, a temperature control mechanism spaced from said pad means and adapted to deliver and receive said thermal fluid, a pair of tubing means interconnecting said mechanism and pad means for separately delivering and returning said thermal fluid, and a coupling interposed in said tubing means, said coupling including a pair of elements having identical hermaphroditic ends in connected relation to each other, one of said elements being connected by said tubing means to said pad means and the other of said elements being connected to and communicating with said temperature control mechanism, each of said elements including a block-like body having a first and second longitudinally extending lumens therethrough, each body having one of said hermaphroditic ends, said hermaphroditic end of each body including a stepped end wall with a first wall portion being equipped with a longitudinally extending tubular projection aligned with said first lumen and a second wall recess aligned with said second lumen and sized to receive the tubular projection of the other body.

4,982,737

ORTHOTIC SUPPORT CONSTRUCTION

Jaime C. Guttmann, Tiradentes No. 10 Centro Comercial Dalyn, Ens. Naco Santo Domingo, Dominican Republic

Filed Jun. 8, 1989, Ser. No. 363,155
Int. Cl.[5] A43B *7/14, 7/18*
U.S. Cl. 128—581 **9 Claims**



1. An orthotic support construction attachable to the sole of a shoe for supporting a selected region of the foot when the shoe is worn, said support construction comprising:

an elongated planar sheet adapted to be attached along one of its major surfaces to the undersurface of the shoe sole, the sheet having an elevated portion of increased thickness projecting from the other of its major surfaces, said elevated portion being located and configured to underlie and support the selected region by exerting pressure through the shoe sole against the selected region,

said sheet being fabricated from a flexible, resilient, shearable, and essentially inelastic material and having a rectangular configuration of greater size than the front portion of the shoe sole,

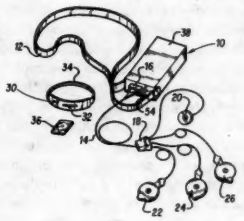
wherein said sheet has lengthwise edges, said elevated portion comprises a rectangular projection arcuately merging, along its ends, into the lengthwise edges of the sheet, and feathered, along its sides, into the other major surface of the sheet, sized to underlie and support the selected region of the foot defined by an area of the foot extending from the arch of the foot to a location adjacent to the metatarseal portion of the foot, and having a plurality of parallel, transverse grooves to allow flexure of said elevated portion with flexure of the shoe sole during walking.

4,982,738

DIAGNOSTIC APNEA MONITOR SYSTEM

Peter Griebel, Freiburg, Fed. Rep. of Germany, assignor to Dr. Madaus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,139
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—670 **4 Claims**



1. Method of diagnosing obstructive sleep apnea in a patient, comprising the steps of:

detecting breathing sounds made by the patient, and the patient's heart rate, while the patient is sleeping;

producing from said breathing sounds, signals indicative of snoring sounds and the time intervals therebetween;

recording said snoring sounds and the time intervals therebetween;

calculating a first respiration disturbance index representing the number of time intervals per hour between episodes of snoring;

producing signals indicative of the patient's heart rate;

recording said heart rate,

calculating the average heart rate and a second respiration disturbance index representing the number of time intervals per hour in which the patient's heart rate remained within a given deviation from its average rate,

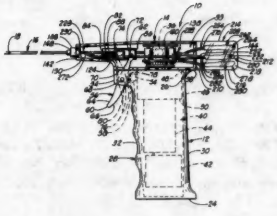
evaluating said first and second respiration disturbance indices to determine whether obstructive apnea is indicated.

4,982,739

BIOSAMPLE ASPIRATOR

George P. Hemstreet, Oklahoma City; Tom J. Love, Jr., and Karl H. Bergey, both of Norman, all of Okla., assignors to Board of Regents for the Univeristy of Oklahoma, Norman, Okla.

Filed Feb. 6, 1989, Ser. No. 307,403
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—750 **45 Claims**



1. An aspirator adapted for use in collecting a biosample and for use with a needle having a first end and a second end with a needle opening extending therethrough intersecting the first and the second ends thereof, comprising:

a biosample collection system comprising:

a biosample collection area comprising a biosample con-

tainer having a collection space sized to receive a biosample;

communicating means for establishing fluidic communication between the needle opening and the biosample collection area comprising:

a biosample connector having an outer periphery, a first end and a second end with a connector opening extending therethrough intersecting the first and the second ends thereof, the first end of the biosample connector being connectable to the second end of the needle and the second end of the biosample connector being connected to the biosample container with the connector opening being in fluidic communication with the needle opening and with the collection space in the biosample container; and

suction means for generating and establishing vacuum and being capable of continuous suction in the biosample collection system whereby a biosample received via the first end of the needle is movably transferred through the needle opening and the communicating means and into the biosample collection area, comprising:

a pump connected to the biosample collection system for generating and establishing a vacuum generally within the needle opening and the connector opening whereby the biosample is sucked through the needle opening and through the connector opening and into the collection space in the biosample container in a driven condition of the pump; and

drive means connected to the pump for activating the pump in the driven condition; and

a pump housing having a first end, a second end and a pump housing component space formed generally between the first end and the second end of the pump housing, the pump housing having an upper surface and a lower surface, the biosample connector being disposed in the pump housing component space and extending generally between the first end and the second end of the pump housing, the second end of the needle being connectable to the first end of the biosample connector and the needle being extendable a distance generally from the first end of the pump housing, the biosample container being connected to the second end of the biosample connector generally near the second end of the pump housing, the pump being disposed in the pump housing component space; and

a handle housing adapted to be gripped by an individual when the aspirator is being used for obtaining a biosample, having an upper end and a lower end, a handle component space being formed in a portion of the handle, a portion of the drive means being disposed generally within the handle component space and a portion of the drive means extending from the handle component space a distance generally above the upper end of the handle housing and being connected with the pump in the pump housing component space.

4,982,740

METHOD FOR USE IN THE HANDLING OF BODY FLUIDS

Bengt-Inge Broden, Gardfarivagen 3, S-532 00 Skara, Sweden

Division of Ser. No. 230,374, Aug. 9, 1988, Pat. No. 4,935,020. This application Jun. 27, 1989, Ser. No. 371,769

Claims priority, application Sweden, Feb. 26, 1986, 8600852

Int. Cl.[5] A16B *5/00*

U.S. Cl. 128—760 **6 Claims**

1. A method for the analysis of organic body fluids, comprising the steps of:

(a) a drawing a sample of an organic body fluid from a patient into a hermetically sealed vacuum tube (1) by suction,

(b) inserting a cannula (3) through a rubber stopper (2) sealing an open end of said tube to equalize a remaining partial vacuum in the tube,

(c) introducing a suction hose (11) into the tube through the cannula,

(d) withdrawing a desired quantity of sample fluid from the tube through the suction hose,

(e) passing said sample quantity to a container (10:23) intended therefor, and

(f) simultaneously with steps (d) and (e) allowing air to pass down into the vacuum tube to displace the withdrawn sample fluid.

4,982,741

APPARATUS FOR DETECTING CERTAIN SUBSTANCES IN URINE, A TOILET STOOL AND A SYSTEM FOR COLLECTING INFORMATION ON HEALTH

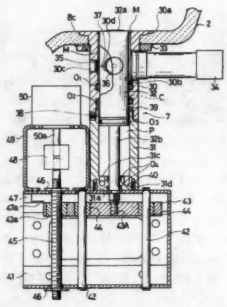
Shiro Saito; Ryuichi Kawamoto; Mineharu Kondo, and Shigeru Sakakibara, all of Aichi, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed May 18, 1988, Ser. No. 195,557

Claims priority, application Japan, May 22, 1987, 62-126448; May 22, 1987, 62-126447

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—771 **9 Claims**



1. An apparatus for examining urine for certain constituents thereof comprising:

vertically disposed cylinder means having at its upper end an opening defining an inlet for urine, said cylinder means including a wall portion, and an enlarged space having a diameter which is larger than that of a remaining portion;

piston means provided vertically movably in said cylinder means;

means for moving said piston means vertically in said cylinder means;

an electrode extending through the wall portion near the enlarged space of said cylinder means and having an end adapted to contact with a liquid in said cylinder means for detecting a constituent of said liquid;

reagent supply means including a cartridge, a pipeline, a valve situated in the pipeline, and a pump, said cartridge being connected to the space of the cylinder means through the pipeline, valve and pump so that a reagent may be supplied into said cylinder means when said valve is opened; and

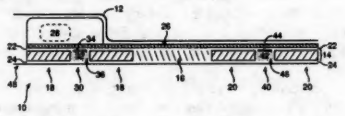
water supply means including a source of water supply, a pipeline connected to the space inside said wall portion and a valve provided in said pipeline of the water supply means, so that water may be supplied into said cylinder means when said valve of the water supply means is opened.

4,982,742

APPARATUS AND METHOD TO FACILITATE HEALING OF SOFT TISSUE WOUNDS

John P. Claude, Redwood City, Calif., assignor to C&Y Technology, Inc., Palo Alto, Calif.

Filed Feb. 22, 1989, Ser. No. 313,981
Int. Cl.[5] A61N *1/18*
U.S. Cl. 128—798 **17 Claims**



1. Apparatus for facilitating the healing of soft tissue wounds, comprising:

circuitry means for generating therapeutic microcurrent excursions;

first and second electrode means coupled to said circuitry means for supplying the microcurrent excursions to a selected area of tissue between said first and second electrode means;

housing means coupled to said first and second electrode means for holding said first and second electrode means apart and adjacent to said selected area of tissue;

a three layered bandage;

a sterile plastic overlay forming a top layer of the bandage;

a flexible circuit strip containing said circuitry means and said first and second electrode means, said flexible circuit strip forming a middle layer of the bandage and situated beneath said top layer; and

bandage base means containing said housing means for holding said first and second electrode means apart, and having a gauze portion adapted to be placed over the selected area of tissue, and adhesive pad means adapted to couple the apparatus to said selected area of tissue, said bandage base means situated beneath said middle layer to form a bottom layer of the bandage;

whereby an electric circuit is completed as microcurrent excursions propagate from said first electrode means across the selected area of tissue to the second electrode means to facilitate healing of the soft tissue wound.

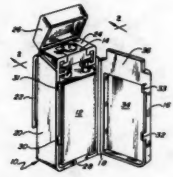
4,982,743

ITCH REDUCER

Marlin R. Pierson, 7010 Chicago Ave., Richfield, Minn. 55423

Filed Mar. 23, 1990, Ser. No. 497,702
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—800 **12 Claims**

1. A low voltage itch reducer characterized by a treatment head comprising a body of electrically insulating material having a substantially flat face surface and spaced electrode structures of opposite polarity carried by said body, said electrode structures providing a pattern of a plurality of spaced electrode tips projecting outwardly from the face surface of said body, said electrode tips at the edges of said pattern defining the perimeter of said pattern, said pattern perimeter having no face dimension greater than about 20 mm, the outward projection of said electrode tips being substantially equal for all electrode tips of said pattern, the spacing distance between electrode tips of opposite polarity being sufficient to prevent



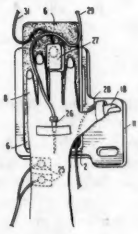
electrical discharge through the air between opposite polarity tips at low voltages up to about 20 volts and being at least about 0.5 mm, and the projection of said electrode tips being such that pressing said head on the skin of a person over an insect bite effectively permits the flat surface of the body of the head to contact the skin with the electrode tips pressing into the skin over the insect bite without puncturing the skin, thereby to cause electrical current flow through the insect bite for reducing the itching of the bite.

4,982,744

HAND AND ARM BOARD FOR USE IN INTRAVENOUS ADMINISTRATION AND OTHER MONITORING TESTS

George Stanec, 15 Secor Rd., Scarsdale, N.Y. 10583

Filed Oct. 14, 1988, Ser. No. 257,581
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—877 **13 Claims**



1. A restraining device for immobilizing a patient's hand, comprising:

a rigid member;

a composite sheet having a pressure sensitive adhesive surface on one side thereof for contact with and adhesive attachment of said hand thereto thereby releasably immobilizing said hand;

releasable fastening means connected to said rigid member and said composite sheet for fastening said composite sheet to said rigid member, wherein said rigid member, said releasable fastening means, and said composite sheet having said adhesive surface together form a multilayer releasable assembly with said hand adapted to be adhered to said composite sheet.

4,982,745

SELF-ELEVATING LIMB SUPPORT

Jack C. Shields, 51916 Continental Ct., Granger, Ind. 46580

Continuation of Ser. No. 297,052, Jan. 17, 1989, abandoned. This application Apr. 9, 1990, Ser. No. 506,585
Int. Cl.[5] A61F 5/37
U.S. Cl. 128—877 4 Claims

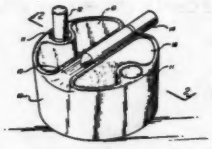
1. A support for elevating a distal end of a patient's limb relative to a proximal end of the limb, said support comprising a conical-like body having opposite distal and proximal ends, said body distal end having a diameter greater than the diameter at said body proximal end, said body including a central through bore extending from said distal end to said proximal end for accommodating said limb with said body distal end positioned adjacent the distal end of said limb and means for securing said body about said limb.

4,982,746

DEVICE FOR SLOWING THE BURNING OF A RESTING CIGARETTE AND FOR EXTINGUISHING A CIGARETTE

Jerry R. Pruyne, 520 I St., Salt Lake City, Utah 84103

Filed Jun. 5, 1989, Ser. No. 361,443
Int. Cl.[5] A24F 13/18
U.S. Cl. 131—235.1 20 Claims



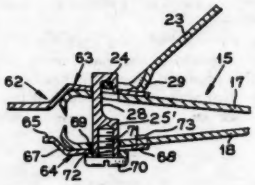
1. A device for extinguishing a cigarette without damaging the physical and taste characteristics of the cigarette thereby allowing the cigarette to be relit for continued smoking, comprising an air compartment; an entrance into the air compartment adapted to allow the burning end of a cigarette to be inserted into the compartment through the entrance without physical damage to the burning end of the cigarette inserted into the compartment, the compartment being configured so that upon insertion of a cigarette thereinto, a substantially closed air chamber is formed communicating with the burning end of the cigarette with the cigarette substantially blocking flow of air into the chamber except through the cigarette itself, the chamber being sized to contain a predetermined quantity of air at the time it is closed by the end of a cigarette to allow continued burning of the cigarette for a predetermined time before the oxygen in the air in the chamber to support burning is exhausted at which time the cigarette goes out due to lack of oxygen to support further burning; and cigarette support means extending into the chamber toward the entrance thereof to contact the center of the burning end of the cigarette to space the burning end of the cigarette from the end of the chamber to allow the air in the chamber to communicate with the burning end of the cigarette.

4,982,747

NAIL CLIPPER WITH NAIL POSITIONING DEVICE

Nyan S. Shah, Mentor, Ohio, assignor to JNN International, Mentor, Ohio

Filed Nov. 10, 1988, Ser. No. 269,450
Int. Cl.[5] A45D 29/18
U.S. Cl. 132—75.5 15 Claims



1. In combination with a nail clipper of the kind having elongated generally mirror image spring arms diverging from a fixed connection at one end and equipped at an opposite end with complementary normally spaced cutting edge jaws which face toward one another and are arranged to be driven into nail clipping engagement by an operating handle lever pivotally connected to a pin extending oscillatably through the arms adjacent to the jaws and permitting the lever to be swung selectively between a nail clipping force applying operative relation and an out of the way inactive relation to the arms, and including:

a nail positioning device comprising a wireform structure having a nail supporting and finger stop bar located forwardly from said jaws and loop means encircling the pin;

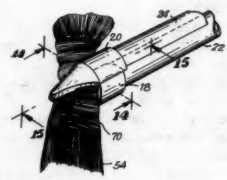
and means for holding said device in nail positioning orientation relative to the clipper jaws when the lever is in the force applying operative relation.

4,982,748

METHOD FOR LENGTHENING NORMAL HAIR

Adriana L. Trimarchi, 18-02 A Corporal Kennedy St., Bayside, N.Y. 11360

Filed Apr. 4, 1988, Ser. No. 177,143
Int. Cl.[5] A41G 3/00, 5/00
U.S. Cl. 132—201 7 Claims



1. A method for the lengthening of normal hair comprising the steps of:

preparing a supply of filaments matching the color of said normal hair,

forming said normal hair into a small section, dividing said section into two parts,

placing said filaments along said division between said parts of normal hair,

crossing said normal hair over said filaments,

crossing said filaments over said normal hair,

crossing said normal hair over said filaments,

releasing a portion of said filaments,

splitting the remaining portion of filaments into two portions,

braiding said two portions of filaments and said two portions of normal hair to form a four-piece braid,

applying a thermally hardenable sealer to the portion of said braid closest to the scalp,

selecting a small portion of said released portion of filament,

wrapping said selected portion filament around said four-piece braid,

applying heat to said wrapped four-piece braid thereby causing said sealer to harden,

engaging said wrapped four-piece braid between heated opposing jaws of a heating means, and bringing said heated jaws to bear on said wrapped four-piece braids.

4,982,749

METHOD OF RECURLING TIGHTLY CURLED HAIR

Debra Baker, and Mike McCardle, both of Columbus, Ga., assignors to Miriam Collins-Palm Beach Laboratories Co., Minneapolis, Minn.

Filed Jun. 1, 1988, Ser. No. 200,944
Int. Cl.[5] A45D *7/04*
U.S. Cl. 132—204 **13 Claims**

1. A process for recurling tightly curled hair, comprising the steps of:

(a) contacting the hair with an effective amount of an aqueous relaxant composition, said aqueous relaxant composition having a pH of between about 8.0 and about 11.0 and comprising between about 5 to about 10 percent by weight of an alkaline thioglycolate based upon the aqueous relaxant composition;

(b) rinsing the hair with a neutral aqueous composition to remove a substantial portion of said relaxant composition;

(c) contacting the hair with an aqueous suspending composition having a pH of between about 3.5 and about 7.0, said aqueous suspending composition comprising between about 0.0001 to about 0.1 percent ammonium chloride and about 0.0001 to 0.1 percent magnesium chloride by weight based upon said aqueous suspending composition;

(d) rolling the hair onto a plurality of curling rods;

(e) contacting the hair with a heat generating composition for a period of time and in an amount sufficient to increase the temperature of the hair to a temperature in the range of between about 100° F. and about 130° F.; the heat generating composition comprising a first solution and a second solution said first and second solutions provided in separate containers until prior to application to the hair, said heat generating composition containing between about 5 and about 10 percent by weight of unreacted alkaline thioglycolate after the reaction of said first and second solutions is complete;

(f) contacting the hair with a sufficient amount of an aqueous oxidizing composition to oxidize substantially all of the remaining alkaline thioglycolate and alkaline thioglycolate derivatives;

(g) removing the curling rods; and

(h) contacting the hair with an acidic final rinse solution for a period of time and in an amount sufficient to cause the hair to reach substantially a neutral pH.

4,982,750

METHOD OF RECURLING TIGHTLY CURLED HAIR

Richard Kaitz, Minneapolis, Minn., assignor to Miriam Collins-Palm Beach Laboratories, Co., Minneapolis, Minn.

Filed Jun. 1, 1988, Ser. No. 201,564
Int. Cl.[5] A45D *7/04*
U.S. Cl. 132—204 **18 Claims**

1. A process for recurling tightly curled hair, comprising the steps of:

(a) contacting the hair with an effective amount of an aqueous relaxant composition, said aqueous relaxant composition having a pH of between about 8.0 and about 11.0 and comprising between about 5 to about 10 percent by weight of a monoethanolamine thioglycolate based upon the aqueous relaxant composition;

(b) rinsing the hair with a neutral aqueous composition to remove a substantial portion of said relaxant composition;

(c) contacting the hair with an aqueous suspending composition having a pH of between about 3.5 and about 7.0, said aqueous suspending composition comprising between about 0.0001 to about 0.1 percent ammonium chloride and about 0.0001 to 0.1 percent magnesium chloride by weight based upon said aqueous suspending composition;

(d) rolling the hair onto a plurality of curling rods;

(e) contacting the hair with a heat generating composition for a period of time and in an amount sufficient to increase the temperature of the hair to a temperature in the range of between about 100° F. and about 130° F.; the heat generating composition comprising a first solution and a second solution said first and second solutions provided in separate containers until prior to application to the hair, said heat generating composition containing between about 5 and about 10 percent by weight of unreacted thioglycolate after the reaction of said first and second solutions is complete;

(f) contacting the hair with a sufficient amount of an aqueous oxidizing composition to oxidize substantially all of the remaining thioglycolate and thioglycolate derivatives;

(g) removing the curling rods; and

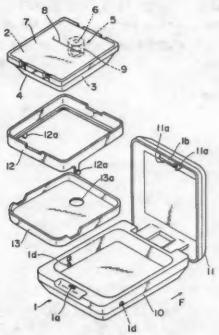
(h) contacting the hair with an acidic final rinse solution for a period of time and in an amount sufficient to cause the hair to reach substantially a neutral pH.

4,982,751

COMPACT CASE

Yoshihiro Oishi, and Nobue Tanaka, both of Shizuoka, Japan, assignors to Pola Chemical Industries, Inc., Japan

Filed Sep. 26, 1989, Ser. No. 412,430
Int. Cl.[5] A45D *33/02*
U.S. Cl. 132—299 **6 Claims**



1. A compact case comprising:

a case body;

a flat plate disposed movably in said case body;

a sealed sack to be filled with a cosmetic material, said sealed sack being disposed under said flat plate;

a pump disposed is said sealed sack, said pump being capable of discharging said cosmetic material when driven by said flat plate, said pump having a discharge hole formed in said flat plate;

a cover stretched over an upper surface of said flat plate so as to cover said discharge hole; and

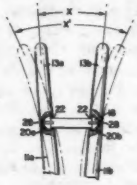
a slit formed in said cover so as to communicated with said discharge hole, said slit is made as a line placed in a position shifted from said discharge hole.

4,982,752

DENTAL FLOSS DEVICE

Nicolas Rodriguez, 1037 9th Ave., Barron, Wis. 54812

Filed Aug. 2, 1989, Ser. No. 388,630
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—327 9 Claims



1. A dental flossing device of the type wherein floss is held between opposing members comprising:

(a) two resilient elongate members each of said elongate members having a first and a second end, said elongate members cooperatively attached at said first end;

(b) cross member means, cooperatively attached to said elongate members between said first and second ends, for joining said elongate members, whereby an inward force applied to said elongate members between said first end and said cross member means causes relative movement of said second ends of said elongate members away from one another and wherein said elongate members pivot about said cross member means and the pivoting action is not restricted by said cross member means, and wherein voids are formed within said elongate members and said cross member means includes head retaining means which co-operatively engage with said voids; and

(c) tip means, cooperatively connected to said second ends of said elongate members, for securing the floss to said elongate members, whereby said floss may be tautly maintained between said elongate members by the application of said force.

4,982,753

WAFER ETCHING, CLEANING AND STRIPPING APPARATUS

Thomas J. Grebinski, Jr., Santa Clara, and Samuel H. Stephenson, Mountain View, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

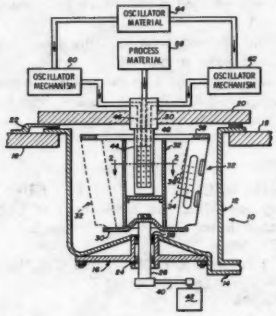
Continuation of Ser. No. 517,291, Jul. 26, 1983, abandoned. This application Oct. 6, 1988, Ser. No. 253,911
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—95 10 Claims

1. A semiconductor wafer processing apparatus comprising:

a body defining first, second and third adjacent ports through which fluid may flow from the body, with said second port being positioned generally between the first and third ports, the ports being positioned so that fluid flow from the first and third ports influences the angle of fluid flow from the second port;

means for varying fluid flow from said first and third ports whereby the angle of fluid flow from said second port is varied; and

means for stationarily supporting a wafer such that at least a portion of the fluid flow from the second port moves



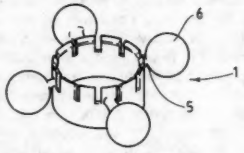
generally across at least a portion of a major face of a so-supported wafer.

4,982,754

POOL CLEANER ACCESSORY

Dieter H. F. Kallenbach, Chartwell, South Africa, assignor to BPH Patent Holding AG, Zug, Switzerland

Filed Sep. 6, 1989, Ser. No. 403,604
Claims priority, application South Africa, Sep. 9, 1988, 88/6719
Int. Cl.[5] E04H *4/16*
U.S. Cl. 134—167 R 3 Claims



1. A swimming pool cleaner accessory comprising a collar to firmly couple contiguous lengths of flexible hose used with a pool cleaner, the collar having a plurality of projections to effect random movement of the pool cleaner which extend radially from the hose and are spaced apart around the periphery of the collar, the projections formed as spherical members on the outer ends of stems projecting from the collar.

4,982,755

FLUX DENSITY CONTROL SYSTEM

Alan S. Roberts, Pointe Claire, Raymond J. Chartrand, Kirkland, John Gileta; Alfred A. Moran, both of Chateauguay, Canada, assignors to Electrovert, Ltd., Lapraire, Canda

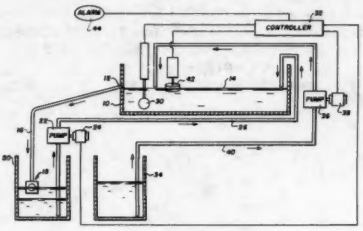
Filed Apr. 26, 1990, Ser. No. 513,998
Int. Cl.[5] G05D *11/06*
U.S. Cl. 137—3 11 Claims

8. In a method of controlling density in a liquid tank wherein a liquid and a thinner are added individually to the tank from a liquid container and a thinner container, the improvement comprising the steps of,

pumping liquid from the liquid container to the liquid tank, overflowing liquid from the tank and returning the overflowing liquid to the liquid container, and

measuring density of liquid in the tank and if the density increases beyond a preset level, cease pumping liquid from the liquid container to the tank, and commence pumping thinner from the thinner container to the tank, when the

density of the liquid in the tank returns to the preset level, cease pumping thinner from the thinner container and



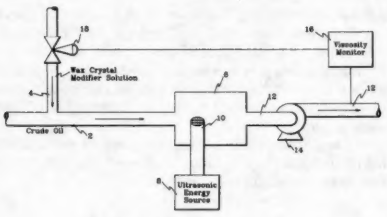
commence pumping from the liquid container to the liquid tank.

4,982,756

USE OF ULTRASONIC ENERGY TO DECREASE THE GEL STRENGTH OF WAXY CRUDE OIL

Michael E. Scribner, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 6, 1989, Ser. No. 418,012
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] F17D *1/16*
U.S. Cl. 137—4 **11 Claims**



1. In a process for flowing waxy crude oil through a pipe line, the improvement which comprises applying ultrasonic energy to the flowing crude oil prior to or after combining with said crude oil a solution of polymeric wax crystal modifier whereby the gel strength of the crude oil-wax crystal modifier is lowered.

4,982,757

FUEL CUTOFF VALVE

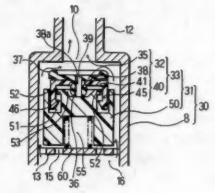
Tamiyosi Ohasi, Aichi; Masami Mizuno, Nagoya; Tomohide Aoki, Gifu, and Osamu Hokari, Kanagawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Isuzu Motors Limited, Tokyo, all of, Japan

Filed Oct. 16, 1989, Ser. No. 422,021
Claims priority, application Japan, Oct. 20, 1988, 63-264889
Int. Cl.[5] F16K *31/22*
U.S. Cl. 137—202 **22 Claims**

1. A fuel cutoff valve disposed between a fuel tank and a canister of a vehicle through which a gaseous fuel in the fuel tank is allowed to pass to the canister but through which liquid fuel is prevented from flowing, said fuel cutoff valve comprising:

a case member disposed between the fuel tank and the canister, said case member including an inlet opening in fluid communication with said fuel tank and an outlet opening in fluid communication with the canister, said outlet opening being defined vertically above said inlet opening;

a float member including a valve and a float body disposed within said case member so that said valve is defined vertically above said float body, a throughhole being defined through said valve, a first annular seal member being defined on an upper surface of said valve peripherally of an upper opening of said throughhole and sized so as to be in close contact with a periphery of said outlet opening when said valve is urged toward said outlet opening, a second annular seal member having a diameter less than a diameter of said outlet opening formed on a lower surface of said valve peripherally of a lower opening of said throughhole and in facing relation to an upper surface of said float body so as to come into close contact with said upper surface of said float body when said float body is urged against said valve, to thereby seal said lower opening of said throughhole;



said valve and said float body being engaged so as to be axially movable relative to one another by an amount which is less than a distance which said float member can move axially within said case member;

said valve including a valve body formed from an elastomer and defining said second seal member and having said throughhole defined therethrough, and a guide means fixedly coupled to said valve body, said guide means being engaged with said float body as to be movable relative thereto by a predetermined amount;

said valve body including a cover having a flat plate shape, said first seal member being defined on an outer circumference of an upper surface of said flat plate cover, said guide means being provided with a base portion of flat plate shape, said base portion of said guide means supporting a lower surface of said flat plate cover,

whereby when liquid fuel flows into said case member, the valve and the float body float together and seal said outlet opening and when liquid fuel leaves said case member and returns to the fuel tank, said float body falls freely.

4,982,758

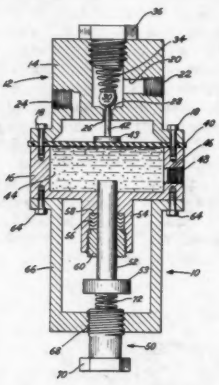
REGULATOR WITH FLUID SUPPORTED AND OPERATED DIAPHRAGM

Leo J. Schlachter, Edgerton, Ohio, assignor to The ARO Corporation, Bryan, Ohio

Filed Jan. 30, 1990, Ser. No. 472,105
Int. Cl.[5] G05D *16/08*
U.S. Cl. 137—505.42 **4 Claims**

1. A pressure regulator comprising a housing having a fluid flow passage therethrough with a fluid inlet at one end of the flow passage and a fluid outlet at the other end of said flow passage, valve means in said housing for controlling the flow of fluid through said flow passage, diaphragm means in said housing for actuating the valve means including an actuator operatively connected to the valve means for moving same, said diaphragm means cooperating with said housing to define a displacement chamber in said housing, a displacement fluid filling said chamber and being in contact with and backing said diaphragm means, a displacement piston adopted to be moved into and out of the displacement chamber in the housing to

control the force applied to the diaphragm means for controlling the flow of fluid through the flow passage at a predetermined value, an adjustment screw on the housing cooperative



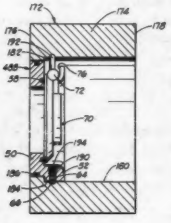
with the displacement piston for adjusting the position of same, and a spring between the adjustment screw and the displacement piston.

4,982,759

SWING CHECK VALVE WITH SECURED CAGE

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Dec. 20, 1988, Ser. No. 286,979
Int. Cl.[5] F16K *15/03*
U.S. Cl. 137—527.8 **5 Claims**



1. A swing check valve, comprising:

a body having planar upstream and downstream ends and a bore therethrough interconnecting the upstream and downstream ends;

a removable valve seat in the bore;

a disc sized to mate with the seat;

a removable ring-shaped cage in the bore supporting the disc for pivotal movement toward and away from the seat; and

means for securing the seat and cage to the wall of said bore against upstream and downstream movement, including mating grooves in the outer periphery of the cage and the wall of said bore; and means extending into said mating grooves

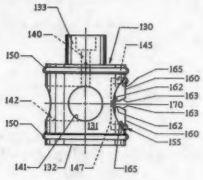
wherein the seat and cage are one member, and wherein said first mentioned means includes an annular shoulder in the bore facing downstream, and a mating shoulder on said member.

4,982,760

THREE-WAY VALVE WITH RADIAL SEAL

Issa Mustaklem, Indianapolis, Ind., assignor to Flotec, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 266,300, Oct. 31, 1988, which is a continuation of Ser. No. 744,044, Jun. 12, 1985, abandoned. This application Aug. 30, 1989, Ser. No. 400,578
Int. Cl.[5] F16K *11/085, 5/04*
U.S. Cl. 137—559 **10 Claims**



1. A valve assembly for controlling fluid flow through at least three flowlines, comprising:

a housing including;

at least three openings, each of said openings having means for engaging a corresponding one of said at least three flowlines in fluid coupling;

a central cavity formed therein having an inner wall defining at least three ports; and

a bore between each of said at least three ports and a corresponding one of said at least three openings;

flow control means, mounted within said central cavity, for completing a fluid path between at least two selected ones of said at least three ports;

a radial seal mounted in said flow control means for preventing fluid migration into said central cavity from non-selected ones of said at least three ports, said radial seal having a sealing face adapted to sealingly engage said inner wall of said central cavity about one of said at least three ports, and further having an inner circumferential surface; and

a seal retainer removably engaged within said radial seal and having a seal engaging face for press-fit engagement with said inner circumferential surface.

4,982,761

VALVED QUICK CONNECT/DISCONNECT COUPLING

Gregory Kreczko, Hudson Ross L. Wagner, Akorn, Richard J. Medvick, Shaker Hts., all of Ohio, assignors to Swagelok-Quick Connect Co., Hudson, Ohio

Filed Jun. 20, 1989, Ser. No. 369,070
Int. Cl.[5] F16L *37/28*
U.S. Cl. 137—614.03 **51 Claims**

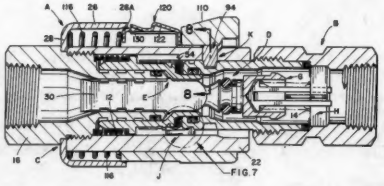


FIG. 7

1. A coupling member for a quick connect/disconnect coupling comprising:

an elongated hollow body having a longitudinal axis and a valve internally supported therein and defining therewith an annular chamber having an axially open end for receiving a mating coupling component; a cylindrical slide sleeve supported by said body for axial movement in said

annual chamber between a closed position engaging said valve and an open position axially displaced from said valve; a cylindrical wiper member mounted for sliding movement on said cylindrical slide sleeve, said cylindrical wiper member having an end face which generally fills the open end of said annular chamber in the area radially outward of said cylindrical slide sleeve; and,

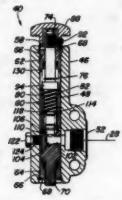
at least one slide closing hook for moving said cylindrical slide sleeve to said closed position, said closing hook having a body located radially outward of said cylindrical wiper member and a finger portion extending radially inwardly through an opening in said cylindrical wiper member into driving engagement with said cylindrical slide sleeve.

4,982,762

HYDRAULIC LIFT WITH WEIGHT TRANSFER

Michael C. Lee; Robert N. Behrens, both of Beaver Dam; Dale R. Dobberpuhl, Horicon; Lloyd A. Wykhuis, Mayville, all of Wis., and Dix S. Montogomery, St. Charles, Ill., assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 324,364, Mar. 15, 1989, Pat. No. 4,920,732.
This application Feb. 12, 1990, Ser. No. 478,336
Int. Cl.[5] F16K *1/04*
U.S. Cl. 137—614.17 **6 Claims**



1. A control valve for actuating a hydraulically operated lift structure to selectively provide a lift function and a weight transfer function, the valve comprising:

a valve body having an inlet port and an outlet port;

a plunger assembly slidably received within the valve body and including a control portion movable between a first position wherein fluid flow between the ports is substantially blocked, and a second position wherein flow between the ports is adjustably restricted;

adjusting means rotatably received within the valve body including an element yielding biased toward a preselected restricting position, and means responsive to rotation of the adjusting means for varying the bias and changing the amount of restriction to flow between the ports when the plunger assembly is in the second position; and

operator control means including a single control for moving the plunger assembly between the first and second positions and for selectively rotating the adjusting means.

4,982,763

PLUG RETAINER

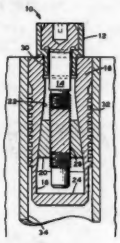
Francis C. Klahn, Huddleston, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 13, 1989, Ser. No. 340,114
Int. Cl.[5] F16L *35/10, 55/18*
U.S. Cl. 138—89 **3 Claims**

1. A plug retainer for retaining a tube plug in its installed position, the tube plug having an open threaded end and a threaded mandrel movably received inside the tube plug, said plug retainer comprising:

a. a locking cup having a longitudinal bore therethrough and an externally threaded lower portion adapted to be threadably received in the open threaded end of the tube plug, said lower portion being of lesser internal and external diameter than the upper portion of said locking cup;

b. a compression ring integral with the upper portion of said locking cup at the junction of said upper and lower portions;



c. a cap screw having a threaded shank fitting through the lower portion of said locking cup and threadably receivable in the threaded mandrel of the tube plug and a head sized to be received within the upper portion of said locking cup; and

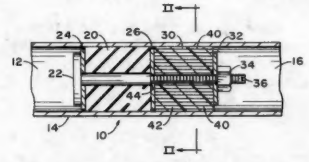
d. a compression ring integral with the head of said cap screw at the junction of said head and shank.

4,982,764

HIGH CONFIDENCE TUBE PLUG

Edward G. Saxon, 230 Rampart Blvd., New Kensington, Pa. 15068

Filed Sep. 26, 1989, Ser. No. 412,718
Int. Cl.[5] F16L *55/10*
U.S. Cl. 138—89 **7 Claims**



1. A high confidence plug for insertion in the bore of a fluid carrying tube, pipes or the like, comprising:

an elastomeric sealing means generally having an axis, for sealing a tube, pipe or the like against fluid flow therethrough;

a hydroscopic friction gripping means axially aligned with the elastomeric sealing means, which swells when contacted with water, for gripping the tube, pipe or the like; and

means for holding the sealing means and the gripping means together, comprising a threaded bolt and nut with the threaded portion of the bolt extending through at least a portion of said hydroscopic friction gripping means, and an end washer between said nut and hydroscopic friction gripping means.

4,982,765

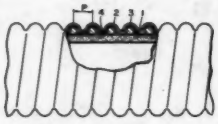
FLEXIBLE COMPOSITE HOSE

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Continuation of Ser. No. 388,128, Jul. 31, 1989, abandoned, which is a continuation of Ser. No. 185,517, Apr. 25, 1988, abandoned. This application Jun. 14, 1990, Ser. No. 538,218

Int. Cl.[5] F16L *11/08*

U.S. Cl. 138—122 7 Claims



1. A flexible composite hose formed by the process comprising the steps of:

providing an inner tube formed from a synthetic resin;

placing a spirally formed metal wire about and in engagement with the inner tube and spirally formed metal wire having a pitch approximately 1.5 to 3.0 times the diameter of the metal wire;

placing an outer tube formed from a thermally shrinkable resin having an inner peripheral surface with an adhesive thereon over the inner tube and the wire; and

subjecting at least the outer tube to heat for melting the adhesive and shrinking the outer tube such that the adhesive adheres substantially to only portions of the inner tube intermediate coils of the spirally formed metal wire and to radially outer portions of the metal wire for providing a secure integral hose structure, radially inner portions of the metal wire being in face to face contact with the inner tube and areas intermediate the metal wire and the inner tube are substantially free of adhesive for insuring flexibility of the composite hose and for preventing collapse of the composite hose.

4,982,766

PAPER MACHINE FABRIC

Seppo Taipale, Sillinjärvi, and Merja Hakkarainen, Juankoski, both of Finland, assignors to Tamfelt Oy Ab, Tampere, Finland

Filed Apr. 25, 1990, Ser. No. 514,447

Claims priority, application Finland, Mar. 2, 1990, 901090

Int. Cl.[5] D03D *23/00*

U.S. Cl. 139—383 A 6 Claims

1. A two-layer paper machine fabric comprising a machine direction yarn system and two cross-machine direction yarn systems, the systems being interlaced in accordance with a 16-shaft weave repeat, wherein the lower cross-machine direction yarn forms floats spanning 13 yarns on the underside of the fabric and is interwoven in the fabric by passing it during one weave repeat over two machine direction yarns positioned close to each other in such a way that at least one machine direction yarn remains between said two machine direction yarns, said at least one machine direction yarn passing over the lower cross-machine direction yarn, and that the upper cross-machine direction paper-contacting yarn forms floats of shorter span as compared with the lower cross-machine direction yarn on the upper side of the fabric and is interlaced with at least two machine direction yarns per weave repeat.

4,982,767

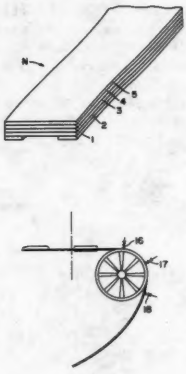
WEAR INDICATOR FOR WEFT GRIPPER STRAP

Luigi Pezzoli, Leffe, and Luigi Favini, Galbiate, both of Italy, assignors to Vamatex S.p.A., Villa Di Serio, Italy

Filed May 8, 1989, Ser. No. 348,425

Int. Cl.[5] D03D *47/00*

U.S. Cl. 139—449 4 Claims



1. The combination of a shuttleless loom and a weft yarn gripper strap, said strap controlling motion of weft yarn grippers along a shed, characterized in that it comprises a plurality of inserts, positioned along the length and within the thickness of the strap, adapted to supply signals indicating wear of said strap prior to a time at which the strap must be replaced.

4,982,768

METHOD AND FILLING ELEMENT FOR DISPENSING LIQUID INTO CONTAINERS

Egon Ahlers, Neu-Bamberg, Fed. Rep. of Germany, assignor to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,714

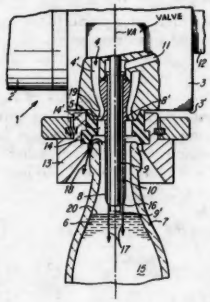
Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815944; Mar. 22, 1989, 3909404

Int. Cl.[5] B65B *3/06*

U.S. Cl. 141—6 15 Claims

1. In a method of dispensing liquid into bottles, cans, or other containers, using a filling element that has a filling element axis, a liquid flow valve, an oppositely disposed surface and a delivery opening, via which, in a filling phase, with said liquid flow valve open, said liquid that is to be dispensed flows into a container that is to be filled through an opening thereof, whereby in a rinsing phase that precedes the filling phase, the interior of said container is supplied with a rinsing gas via a tubular member that extends through said opening of said container into the interior thereof, with said rinsing gas being discharged into said container from a gas conduit including an

opening provided at a bottom end of said tubular member, comprising the improvement therewith including the step of:



supplying said rinsing gas to the interior of said container via said gas conduit opening in the form of an annular opening that extends concentrically about said filling element axis.

4,982,769

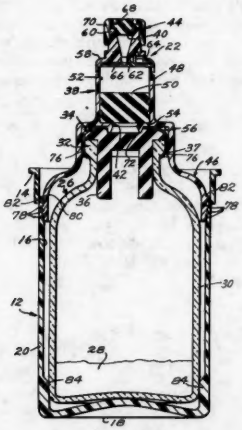
PACKAGE

Donald J. Fournier, Cleveland, Ohio, and Douglas W. Jacobs-Perkins, Kensington,, Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Feb. 21, 1990, Ser. No. 482,874

Int. Cl.[5] B65D *83/10, 81/32*

U.S. Cl. 141—98 **19 Claims**



1. A package comprising a package container structure having an open end leading into an interior chamber therein,

a package lid structure mounted over the open end of said package container structure in generally sealed relation with the interior chamber thereof so as to be moved into opening relation thereto, and

a device within said sealed interior chamber having means for cooperating with a medicament vial for use therewith,

said device and said package container structure having interengageable means disposed out of operative interengagement when said device is disposed within said sealed interior chamber operable when said package lid structure is moved into opening relation and said device is moved out of the open end of said interior chamber to be moved into operative interengagement,

said device and said package container structure with the interengageable means thereof operatively interengaged providing a generally sealed interior space including said interior chamber within which space the means of the device for cooperating with a medicament vial is operable to cooperate with a medicament vial contained within said space.

4,982,770

APPARATUS FOR FILLING SPECIFIED AMOUNT OF LIQUID

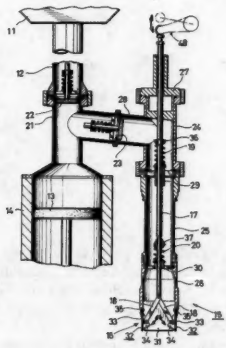
Yoshihiro Saijo; Takashi Arao, and Yoshitaka Yamane, all of Tokushima, Japan, assignors to Shikoku Kokoki Co., Ltd., Tokushima, Japan

Continuation of Ser. No. 230,539, Aug. 10, 1988, abandoned. This application Feb. 8, 1990, Ser. No. 477,143

Claims priority, application Japan, Aug. 13, 1987, 62-202258; Aug. 13, 1987, 62-202259; Aug. 13, 1987, 62-202260

Int. Cl.[5] B67C *3/20*; B67D *3/00*

U.S. Cl. 141—258 **10 Claims**



1. A liquid filling apparatus comprising:

a metering means for feeing a predetermined amount of liquid, the metering means having,

(a) a metering cylinder having a piston therein,

(b) a filling nozzle for receiving predetermined amount of liquid from the metering cylinder by the operation of the piston, the filling nozzle having an open lower end,

(c) a damper means provided at the open lower end of the filling nozzle for opening and closing the same,

(d) a movable vertical rod positioned within said filling nozzle and directly attached to the damper at one end thereof, the other end of the movable rod extending outside of the filling nozzle and of the metering means, the movable vertical rod being capable to take an upward position to close the damper and a downward position to open the same,

(e) a spring means positioned between the filling nozzle and the movable rod for biasing the movable rod in order to close the open lower end; and

a rocker arm means positioned at the outside of the metering means and in the vicinity of the other end of the movable rod and for driving the movable rod solely to open the damper, the rocker arm means being independent of the movable vertical rod and having a rocker arm and a driving means for intermittently driving the rocker arm in a manner such that the rocker arm is capable to take a first position to drive the movable vertical rod to take the downward position to open the damper means only when the liquid within the filling nozzle is to be released and to take a second position away from the movable rod to allow the movable rod to return to the upward position

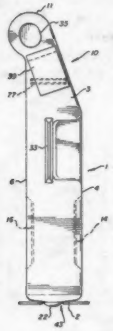
solely by the action of the spring means to close the damper means.

4,982,771

PARTICULATE MATERIAL COLLECTION BOTTLE FOR REPRODUCTION APPARATUS

Gary B. Bertram, Honeoye Falls, and James A. McGlen, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1989, Ser. No. 438,815
Int. Cl.[5] B65B *1/04*; G03G *15/06*
U.S. Cl. 141—312 3 Claims



1. A bottle of collecting particulate material in a reproduction apparatus, which reproduction apparatus has a tube of generally circular cross section through which particulate material is fed and a recessed detent spaced below said tube, said bottle comprising:

a bottom wall having a an integrally formed detent cooperable with the recessed detent in said apparatus, said bottom wall detent consisting of a generally centrally located externally directed protrusion from said bottom wall,

side walls extending away from said bottom wall to a top portion, said bottom wall being angled from said protrusion to at least one of said side walls to permit engagement of said bottom wall detent with said recessed detent,

means defining an opening in the first of said side walls in said top portion for receiving the tube of a receiving reproduction apparatus with said bottle being wedgeable between the tube and said detent of the receiving apparatus as permitted by said angled bottom wall.

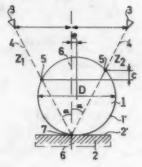
4,982,772

METHOD IN DETERMINING PRIMARILY THE FORM AND/OR THE POSITION OF ELONGATE TIMBER ITEMS AND APPARATUS FOR CARRYING OUT THE METHOD

Hans Dutina, Saltsjö-Boo, Sweden, assignor to Hans Dutina Research & Development AB, Saltsjö Boo, Sweden

Filed Sep. 28, 1987, Ser. No. 101,428
Claims priority, application Sweden, Sep. 30, 1986, 8604146
Int. Cl.[5] B27B *1/00*; B26D *5/00*
U.S. Cl. 144—357 39 Claims

1. Method in working of elongate timber items, including logs and elements thereof with two substantially parallel, longitudinal surfaces achieved by processing, during longitudinal feed of the timber item, including the steps of: determination of a given lateral characteristic, such as position and form, of the timber item at at least one position along the item including the step of sensing with the aid of sensing means which sense distances from the sensing means to the surface of the timber item, longitudinally moving the timber item and the sensing means relative to each other, disposing said timber item on a support path surface spaced apart from said sensing means, the step of sensing taking place with the aid of touch-free distance-sensing means (3), with discrete, predetermined measuring directions, for determining the distance from said sensing means to at least two measuring points (5) on the surface (1') of the timber item (1); said measuring points being substantially in a cross-section of the timber item and on different sides of a reference line (6) transverse to the support path and across the said cross-section; accomplishing the step of said sensing along at least two selected separate measuring directions from a plurality of measuring directions, two of said plurality of measuring directions, which can be selected, being directions along two parallel paths and another two of said plurality of measuring directions, which can be selected, being directions along two at least partially counter-directed directions (4) which are transverse to the longitudinal direction of the timber item, intersect each other and where each of said respective counter-directed measuring directions (4), seen in the longitudinal direction of the timber item, intersect to form an angle (α) to a vertical line from the support path surface, and the two measuring directions which can take place in at least two parallel directions (4) are parallel to processing planes (4'), along the longitudinal direction of the timber item, and parallel to said reference line (6), the sensed distance information to said timber item thus obtained being utilized for determining a given lateral characteristic of said timber item.

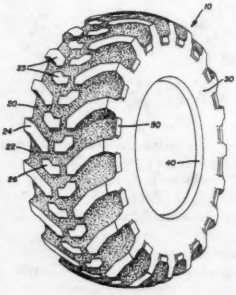


4,982,773

PNEUMATIC TIRE INCLUDING SPACED SIDEWALL PROJECTIONS

Mark L. Bonko, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 3, 1989, Ser. No. 331,714
Int. Cl.[5] B60C *13/02*
U.S. Cl. 152—209 B 3 Claims



1. A pneumatic tire designed primarily for off-road use, the tire comprising:

a pair of bead regions;

a pair of sidewalls;

a ground-engaging tread, the respective sidewalls extending between respective beads and the tread, the tread having

a net-to-gross ratio in the range from 25% to 40% and having circumferentially spaced center lugs and lateral tread lugs projecting radially from an inner tread surface and the lateral tread lugs being substantially parallel to one another on each side of the tire's equatorial plane and extending axially inwardly from a tread edge, the axially outermost surface of the lateral tread lug being adjacent to the sidewall, the inner tread surface between the tread lugs and at the tread edges having curvature in both the axial and circumferential directions, the parallel lateral lugs forming with the inner tread surface a soil discharge area, the soil during tire use being pushed axially outwardly;

a series of projections integral with the sidewall, the projections being arranged in a circular pattern, each projection being axially adjacent and axially outward and radially equal or inward of the inner tread surface and outwardly of the sidewall, each projection being interposed between lateral tread lugs and having a radially outermost surface which has the same curvature in the axial direction as the adjacent inner tread surface and is an axial continuation of the inner tread surface; and

the projections being positioned to provide during tire use deflection of soil and debris away from the sidewalls, the sidewalls being protected around the circumference of the tire by axial discharge of the soil and debris from the inner tread surfaces over the adjacent discontinuous sidewall projections.

4,982,774

TREAD PROFILE FOR A PNEUMATIC VEHICLE TIRE

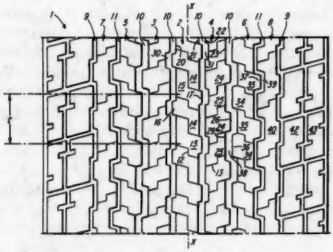
Karlheinz Evertz, Herzogenrath-Kohlscheid, Fed. Rep. of Germany, assignor to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 369,774

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 8807996[U]

Int. Cl.[5] B60C *11/06, 11/12*

U.S. Cl. 152—209 R **6 Claims**



1. In a pneumatic vehicle tire of radial carcass construction with a belt-like reinforcement of a profiled tread strip, whereby the tread profile is comprised of several axially adjacent, circumferentially extending profiled ribs that are separated from one another by circumferentially extending grooves and that are provided with fine slits that extend at an angle to the circumferential direction of said tire, the improvement wherein:

rune-shaped profiled rib segments are formed by fine slits that are stepped, with said rib segments being disposed in such a way that:

a profiled rib disposed in a central portion of said tread profile, and respective profiled ribs disposed in respective shoulder portions of said tire, each comprise first profiled rune-shaped rib segments that have a first lug-shaped segment portion that extends beyond first side edges of these ribs that extend parallel to said circumferential direction, and also comprise second rune-shaped profiled rib segments that have a second lug-shaped segment portion that extends beyond second side edges of these ribs that also extend parallel to said circumferential direction, with said first and second rune-shaped profiled rib segments of a given one of these ribs being disposed adjacent one another, having essentially identical contours, and being turned by 180° relative to one another;

respective profiled ribs disposed between said central rib and said shoulder ribs each comprise third rune-shaped profiled rib segments that have a third lug-shaped segment portion that extends beyond third side edges of these ribs that extend parallel to said circumferential direction, and also comprise a stepped fourth rune-shaped profiled rib segment that has fourth side edges that extend parallel to said circumferential direction, with said third and fourth profiled rib segments of one of these ribs disposed between said central rib and one of said shoulder ribs, and said third and fourth profiled rib segments of the other of these ribs disposed between said central rib and the other of said shoulder ribs, having essentially identical contours respectively, and being turned by 180° relative to one another and with said third and fourth rune-shaped profiled rib segments being disposed adjacent one another; and

all of said lug-shaped segment portions, which project laterally into said circumferentially extending grooves, are disposed across from correspondingly shaped recess means in adjacent ones of said profiled ribs.

4,982,775

PNEUMATIC TIRES HAVING REDUCED NEGATIVE RATIO VARIATION

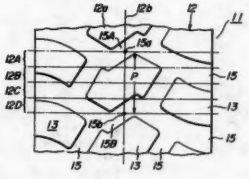
Kenji Matsumoto, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,645

Claims priority, application Japan, Dec. 18, 1987, 62-320590

Int. Cl.[5] B60C *11/11*

U.S. Cl. 152—209 B **4 Claims**



1. A pneumatic tire comprising; a tread divided into land portions in the circumferential and widthwise directions of the tire by first grooves continuously extending in the widthwise direction of the tire and second grooves circumferentially disposed at both sides with respect to the equator of the tire and connecting adjoining first grooves to each other, wherein when a distance between centers in the circumferential direction of the adjoining first grooves at the center of the tread is a pitch and divided into four equal zones, a negative comparison ratio (R) of a maximum negative ratio to a minimum negative ratio among negative ratio M at four divided zones of the tread in one pitch is not more than 1.22.

4,982,776

CORD LOCK FOR A VENETIAN BLIND OR A SHADE

Otto Kuhar, Garfield, and Robert C. Kross, Kearny, both of N.J., assignors to Levolor Corporation, Sunnyvale, Calif.

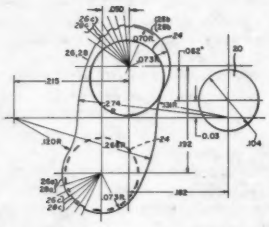
Filed Feb. 23, 1989, Ser. No. 314,649

Int. Cl.[5] E06B *9/324*

U.S. Cl. 160—178.2 **6 Claims**

1. A cord lock for a lift cord of a blind or shade, comprising:

a housing having a base for connection to a head channel of the blind or shade, two side walls in spaced, substantially parallel relationship to each other and extending substantially perpendicularly to said base, each side wall having a slot, said slots being in alignment with each other, a cam extending in said housing through said slots and being slidably and non-removably received in said slots, and a pulley non-rotatably mounted in said housing spaced from said slots, each slot having an



S-shaped contour, with a bottom leg adjacent said base and a top leg remote therefrom, said bottom leg curving away from said pulley, said top leg curving towards said pulley, the relationship between the location of said slot, and said pulley and the dimensions of said slot, pulley and lift cord being such that lift cord passing in said housing over said pulley and between said cam and said pulley is releasably locked between said cam and pulley.

4,982,777

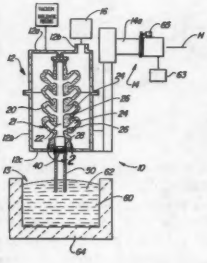
COUNTERGRAVITY CASTING METHOD AND APPARATUS

George D. Chandley, Amherst, N.H., assignor to Metal Casting Technology Inc., Milford, N.H.

Continuation-in-part of Ser. No. 234,583, Aug. 22, 1988, abandoned. This application Jan. 27, 1989, Ser. No. 303,813

Int. Cl.[5] B22D *18/06*

U.S. Cl. 164—63 **23 Claims**



1. A method for the countergravity casting of molten metal, comprising:

(a) forming a mold having a mold cavity, a lower mold portion adapted for immersion in an underlying molten metal pool and a constricted inlet passage means between the mold cavity and the lower mold portion,

(b) relatively moving the mold and the pool to immerse said lower mold portion in the pool,

(c) applying a differential pressure between the mold cavity and the pool to urge the molten metal upwardly through the inlet passage means into the mold cavity to fill the mold cavity with the molten metal,

(d) relatively moving the mold and the pool to withdraw said lower mold portion from the pool while the entire metal in said mold cavity and inlet passage means remains in the molten state, including maintaining a differential pressure on the molten metal in the inlet passage means which is so constricted in size as to coact with said differential pressure to substantially prevent the molten metal from running out of said inlet passage means and said mold cavity after withdrawal of said lower mold portion from the pool and before the molten metal solidifies in said inlet passage means, and

(e) solidifying the molten metal in said inlet passage means.

4,982,778

MOLDING PROCESS AND APPARATUS

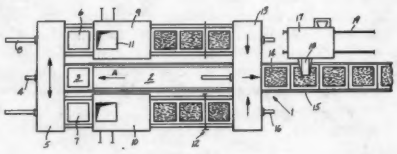
Wendelin Weimann, Klettgau, Fed. Rep. of Germany, assignor to Georg Fischer AG, Schaffhausen, Switzerland

Filed Sep. 1, 1989, Ser. No. 401,945

Claims priority, application Switzerland, Sep. 1, 1988, 03270/88

Int. Cl.[5] B22D *5/00, 33/00;* **B22C** *9/20*

U.S. Cl. 164—130 **5 Claims**



1. A molding process for circulating molding boxes in a molding plant wherein molding boxes comprising upper and lower molding boxes are fed to a molding machine wherein a sand mold is formed in the molding boxes and thereafter conveyed to a transfer apparatus where the upper and lower boxes are joined so as to form a casting mold and thereafter transferred to a casting station where molten metal is fed to the casting mold and thereafter fed along a primary cooling line to an ejector station wherein the metal casting and surrounding sand mold is ejected from the molding boxes and the molding boxes are returned to the molding machine, the improvement which comprises adjusting the length of the primary cooling line so as to insure sufficient time for solidification of the metal casting outer shell so as to be sufficiently firm as to allow for further transportation of the metal casting and surrounding sand mold as a unit after ejection at the ejector station, providing a secondary cooling line downstream of said ejector station for receiving said unitary metal casting and surrounding sand mold wherein said secondary cooling line comprises a horizontal conveyor having two lateral guide walls and feeding said unitary metal castings and surrounding sand molds successively to said secondary cooling line in an abutting manner such that said abutting sand molds directly contact each other wherein the sand molds are supported laterally by said guide walls and said abutting sand molds and by said horizontal conveyor such that said sand molds are held in a dimensionally stable manner about the metal castings to insure that the metal castings are stable during transport along the secondary cooling line whereby said metal castings are completely solidified.

4,982,779

SHUT-OFF DEVICE FOR USE IN A GUIDE CONDUIT OF A HORIZONTAL CONTINUOUS CASTING APPARATUS

Yoshitaka Nagai, Asahi; Makoto Arase, and Norio Ohatake, both of Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 492,800

Claims priority, application Japan, Mar. 17, 1989, 1-29709[U]

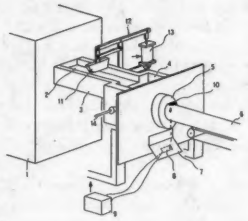
Int. Cl.[5] B22D *11/10, 11/18*

U.S. Cl. 164—152 **1 Claim**

1. In a horizontal continuous casting apparatus, a shut-off

device for use in a guide conduit of the horizontal continuous casting apparatus, including

(1) a stopper capable of blocking a stream of melt flowing in said guide conduit which introduces said stream of melt from a furnace into a tundish therethrough, and



(2) a receiving plate disposed below a cooling mold so as to receive a leakage melt and having a heat sensor, said heat sensor being adapted to detect heat from said leakage melt and communicating with a converter for transmitting operation signals to said stopper.

4,982,780

METHOD OF PRODUCING METAL FILAMENT AND APPARATUS MATERIALIZING SAME

Alexandr V. Stepanenko, ulitsa Surganova, 10, Kv. 25, Minsk; Mikhail N. Vereschagin, ulitsa Ogorenko, 17, kv. 149; Oleg I. Paly, ulitsa Staro-Chernigovskaya, 15, kv. 76, both of Gomel; Valery K. Sheleg, prospekt Masherova, 3, kv. 38; Vyacheslav M. Kaptsevich, ulitsa Surganova, 60/1, kv. 55, both of Minsk; Valery E. Gorunov, ulitsa Pesina, 78, kv. 54; Evgeny A. Lapitsky, ulitsa Bogdanova, 1, kv. 22, both of Gomel; Anatoly G. Kostornov, ulitsa Juliusa Fuchika, 13, kv. 26, Kiev, and Alexandr V. Kholomeev, Roschinsky pereulok, 1, kv. 1, Gomel, all of U.S.S.R.

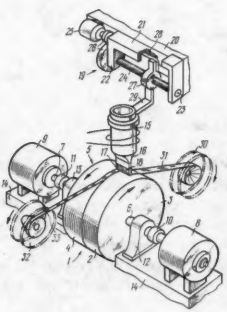
PCT No. PCT/SU88/00138, § 371 Date Mar. 21, 1989, § 102(e) Date Mar. 21, 1989, PCT Pub. No. WO89/00468, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 18, 1988, Ser. No. 336,670

Claims priority, application U.S.S.R., Jul. 21, 1987, 4272733; Jul. 21, 1987, 4272731; Jul. 21, 1987, 4272728; Jul. 21, 1987, 4272730

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—463 **5 Claims**



1. A method of producing metal filaments comprising the steps of arranging a main chill surface and at least one additional chill surface in substantial contact with each other with a junction line formed between the surfaces, continuously moving the main chill surface and the additional chill surface in a manner providing relative displacement between the surfaces, continuously feeding a supply of molten metal simultaneously onto the main chill surface and the additional chill surface such that the supply of molten metal extends across the junction line between the surfaces, using the main chill surface and the additional chill surface and the relative displacement therebetween to chill the molten metal on the respective surfaces and separate the molten metal into a main filament and an additional filament, separating the main filament from the main chill surface and the additional filament from the additional chill surface and independently reeling the main filament and the additional filament after separation from the respective surfaces.

4,982,781

NO-BAKE PROCESS FOR PREPARING FOUNDRY SHAPES FOR CASTING LOW MELTING METAL CASTINGS

William G. Carpenter, Powell, and William R. Dunnavant, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Filed Feb. 9, 1989, Ser. No. 308,346

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] B22C *11/22*

U.S. Cl. 164—526 **15 Claims**

1. A no-bake process for the fabrication of foundry shapes which comprises:

(a) mixing a foundry aggregate with a bonding amount of up to about 10% by weight, based upon the weight of the aggregate, of a binder composition comprising:

(1) a phenolic resole resin component comprising:

(a) a phenolic resole resin prepared by reacting formaldehyde with a phenol in a molar ratio of formaldehyde to phenol of at least 1.0 and in the presence of a divalent metal catalyst, such that the resulting resin contains polymeric structures having a preponderance of bridges joining the phenolic nuclei of the polymer which are ortho-ortho benzylic ether bridges;

(b) an effective amount of a polyester polyol; and

(c) a solvent in which the phenolic resole resin is soluble, and such that the solvent is present in an amount of from 20 to 80 weight percent based upon the weight of the phenolic resole resin; and

(2) a polyisocyanate hardener component; and

(3) a catalytically effective amount of a liquid tertiary amine catalyst;

(b) introducing the foundry mix obtained rom step (a) into a pattern;

(c) allowing the foundry mix to harden in the pattern until it becomes self-supporting; and

(d) thereafter removing the shaped foundry mix of step (c) from the pattern and allowing it to further cure, thereby obtaining a hard, solid, cured foundry shape.

4,982,782

METHOD AND APPARATUS FOR SIMULTANEOUS HEAT AND MASS TRANSFER

Walter F. Albers, Phoenix, and James R. Beckman, Tempe, both of Ariz., assignors to Walter F. Albers, Phoenix, Ariz.

Continuation of Ser. No. 883,734, Jul. 9, 1986, Pat. No. 4,832,115. This application Apr. 4, 1989, Ser. No. 333,571

Int. Cl.[5] F23D *3/04;* B01F *3/04;* B01D *47/12*

U.S. Cl. 165—1 **8 Claims**

1. A method of changing at least one selected property of two wetting substances comprising the steps of:

segmentedly wetting sectors of a first chamber with a first wetting substance;

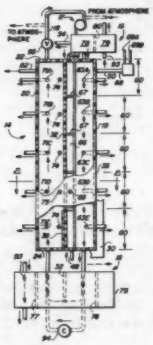
providing a migratory movement of said first substance;

segmentedly wetting sectors of a second chamber with a second wetting substance;

thermally coupling said first and said second chambers by a heat transferring partition;

causing a flow of a gas through said first and said second chamber; and

altering a temperature of said gas between said first chamber and said second chamber, said flow of gas and said thermal



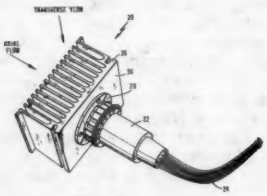
coupling causing a change in selected properties of said first and said second wetting substance, said selected properties changing among said sectors, wherein interaction between said first substance and said migratory movement causes at least one selected property of said first substance of a sector to influence said at least one selected first substance property in an adjacent sector.

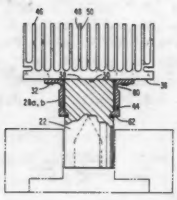
4,982,783

SELF-TIGHTENING HEAT SINK

Robert A. Fickett, San Jose, and Gordon R. Lavering, Belmont, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 12, 1988, Ser. No. 274,879
Int. Cl.[5] F28F *7/00*
U.S. Cl. 165—80.1 **22 Claims**





1. A self-tightening heat sink unit, attachable to a correspondingly formed heat transfer portion of a hot body to conductively receive heat therefrom, comprising:

a heat sink element having a first surface for making thermally conductive forcible contact thereat with a corresponding first contact surface of said heat transfer portion of said hot body to receive heat therefrom;

contact forcing means for providing said forcible contact between said heat sink element and said hot body under the action of a compressive force acting between said heat sink element first surface and said hot body first contact surface, wherein said contact forcing means also continually acts during use of the heat sink unit to promote an increase in said compressive force to thereby enhance conductive heat transfer from the hot body to the heat sink element;

said contact forcing means comprising at least one connector element attachable to said heat sink element and forcibly engageable with a connector contacting portion of said hot body; and

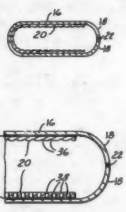
said contact forcing means further comprising tightening means for coacting with said at least one connector element and continually acting during use of said heat sink unit to increase a force of engagement between a hot-body-contacting portion of said connector element and said connector-contacting portion of said hot body.

4,982,784

COMPOSITE HEAT EXCHANGER TUBE

Eugene E. Rhodes, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1988, Ser. No. 251,420
Int. Cl.[5] F28F *13/12*
U.S. Cl. 165—109.1 **11 Claims**



1. A composite heat exchanger tube, comprising:

a turbulence promoting liner having surface variations including a plurality of turbulence promoting indentations which promote turbulence of liquid flowing through said tube and said liner comprising a sacrificial metal; and

an outer tube telescoped about said liner and joined thereto.

5. A heat exchanger, comprising:

a pair of headers for receiving a plurality of heat exchanging tubes, with each header having an end tank attached thereto; and

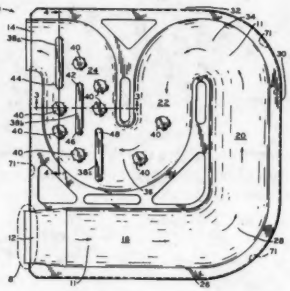
a plurality of composite heat exchanger tubes extending between said headers, with each of said tubes comprising a turbulence promoting liner having surface variations including a plurality of turbulence promoting indentations which promote turbulence of liquid flowing through said tubes and an outer tube telescoped about said liner and brazed thereto.

4,982,785

SERPENTINE HEAT EXCHANGER

Ronald S. Tomlinson, Mt. Juliet, Tenn., assignor to Inter-City Products Corporation (USA), Lavergne, Tenn.

Filed Mar. 6, 1990, Ser. No. 489,461
Int. Cl.[5] F28F *3/12*
U.S. Cl. 165—170 13 Claims



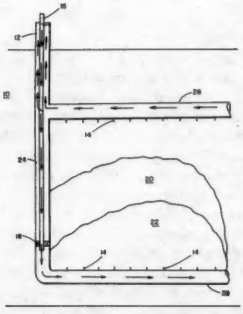
1. For use in a furnace having a burner means for providing hot products of combustion, and an air flow means for circulating conditioned air, a heat exchanger for transferring heat from products of combustion to conditioned air, said heat exchanger comprised of first and second matched clamshell plates assembled together, said plates connected at their respective edges by a sealing means for providing a seal thereat, each said plate having an internal surface defining a depression, said depressions together defining a serpentine passageway, an entrance and exhaust ported formed in said passageway, said surfaces including elongated ribs for obstructing fluid flow adjacent said exhaust portal and for directing fluid flow to under-utilized portions in said passageway.

4,982,786

USE OF CO_2/STEAM TO ENHANCE FLOODS IN HORIZONTAL WELLBORES

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 14, 1989, Ser. No. 379,759
Int. Cl.[5] E03B *3/11*
U.S. Cl. 166—50 5 Claims



1. A method for recovering hydrocarbonaceous fluids from a formation penetrated by at least two horizontal wells comprising:

(a) injecting liquid carbon dioxide through at least one lower horizontal well into said formation at a pressure insufficient to fracture said formation;

(b) thereafter injecting steam into said lower horizontal well, thereby causing said liquid carbon dioxide to convert to its gaseous state and expand thereby making a substantially better sweep of the formation;

(c) recovering hydrocarbonaceous fluids, gaseous carbon dioxide, steam and water from said formation via at least one upper horizontal well; and

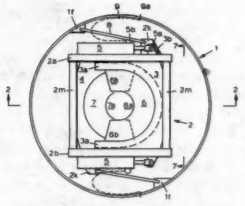
(d) repeating steps (a), (b) and (c).

4,982,787

PIPE WIPER SYSTEM

Jeffrey A. Reddoch, 104 Ramblewood Dr., Lafayette, La. 70508

Filed Jan. 2, 1990, Ser. No. 495,470
Int. Cl.[5] E21B *33/08*
U.S. Cl. 166—82 15 Claims



1. In a pipe wiper assembly for stripping fluid from the outer surface of a well string, the assembly comprising a container having side walls, a pair of pipe wiper blades situated within said container and movable between an open position, wherein they are disassociated from the well string, and a closed position, wherein they are pressed against the well string,

the improvement comprising:

a frame situated within said container, for limited horizontal movement therein, having a horizontal guideway to accept said pipe wiper blades for movement from opposite sides of said well string between said open and said closed positions;

a pair of fluid power cylinder assemblies for each of said pipe wiper blades, mounted on said frame, arranged for linking said frame and said pipe wiper blade for movement between said open and said closed positions; and

flexible means, connected to said fluid power cylinder assembly, for supplying fluid power thereto.

4,982,788

APPARATUS AND METHOD FOR REMOVING VOLATILE CONTAMINANTS FROM THE GROUND

Lawrence A. Donnelly, 1062 Washington Dr., Centerport, N.Y. 11721

Filed Mar. 10, 1989, Ser. No. 321,936
Int. Cl.[5] E21B *43/24, 43/40, 23/00;* E02D *3/11*
U.S. Cl. 166—266 34 Claims

1. An apparatus for removing a volatile contaminant from portions of ground contaminated with said contaminant, comprising:

a first well extending down into the ground;

a second well in proximity to said first well and arranged substantially in parallel with said first well;

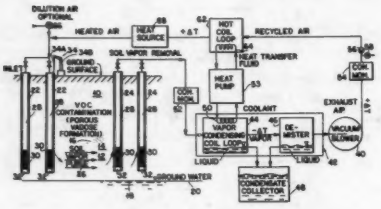
air removing means for removing air and vapor of said volatile contaminant from said first well; and

condensing means for condensing contaminant contained in said air removed from said first well; wherein said condensing means includes a heat pump, said heat pump having a cold coil loop and a hot coil loop, said cold coil loop being for cooling air removed from said first well; and said hot coil loop being for heating air moved into said

second well when said air removing means removes air from said first well.

12. A method for removing a volatile contaminant from portions of ground contaminated with said contaminant and having drilled therein at least two substantially parallel wells extending downward into the ground, comprising the steps of:

(a) inserting into at least one of said wells a first pipe having an outer diameter such that it fits tightly into said at least one well, said pipe having a continuous wall without



openings along a substantial portion of its length, a closed bottom, and an array of openings along a limited portion of its length;

(b) adjusting depth of the array of openings of said first pipe to a lowest level of said contaminant above ground water;

(c) circulating air between said first pipe and a second pipe to purge the ground of the volatile contaminant;

(d) adjusting depth of the array of openings to a second level above said lowest level; and repeating step (c).

4,982,789

METHOD OF USING UREA AS A SACRIFICIAL AGENT FOR SURFACTANTS IN ENHANCED OIL RECOVERY

Gabriel Prukop, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,680
Int. Cl.[5] E21B *43/22, 43/24*
U.S. Cl. 166—272 **9 Claims**

1. A sacrificial agent method for reducing the loss of surfactants to an underground formation in enhanced oil recovery operations, which comprises:

injecting an aqueous solution of about 0.05% to about 10% urea by weight into an underground formation to reduce the loss of surfactant to the underground formation,

said underground formation having a temperature greater than about 130° F. to hydrolyze the injected urea.

4,982,790

METHOD TO REDUCE MOVEMENT OF A CPF DEVICE VIA A GELLED PETROLEUM BASED FLUID

William C. Hunt, III, Farmers Branch, and Craig H. Phelps, Carrollton, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

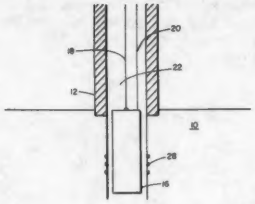
Filed Dec. 29, 1989, Ser. No. 459,119
Int. Cl.[5] E21B *43/263*
U.S. Cl. 166—299 **17 Claims**

1. A method for imparting high drag forces on a suspended propellant housing means and a propellant igniting means within a wellbore during controlled pulse fracturing comprising:

(a) directing a gelled viscous petroleum fluid containing a surfactant and an organic cross-linker into a wellbore penetrating a water-sensitive formation which fluid is of a height sufficient to submerse said housing means and igniting means;

(b) suspending said housing means with propellant therein and the igniting means into said wellbore and fluid near said formation's productive interval; and

(c) igniting said propellant thereby generating energy and pressure sufficient to initiate simultaneous multiple radial fractures while forcing said fluid upwardly in said wellbore whereby the fluid's viscosity is sufficient to substan-



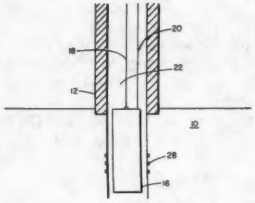
tially enhance viscous drag thereby minimizing movement of a remnant of said housing means and the wireline so as to prevent damage thereto.

4,982,791

METHOD TO REDUCE MOVEMENT OF A CPF DEVICE VIA A DRAG-REDUCING FLUID TAMP

William C. Hunt, III, Farmers Branch, and Craig H. Phelps, Carrollton, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 459,116
Int. Cl.[5] E21B *43/263*
U.S. Cl. 166—299 **7 Claims**



1. A method for reducing drag forces on a suspended propellant housing means and a propellant igniting means within a wellbore during controlled pulse fracturing comprising:

(a) directing an uncomplexed, ungelled polymer fluid into a wellbore thereby making a fluid of a height sufficient to submerse said housing means and igniting means where said fluid is of a viscosity sufficient to flow freely past said housing means and the igniting means;

(b) suspending said housing means with propellant therein and the igniting means into said wellbore and fluid near a formation's productive interval; and

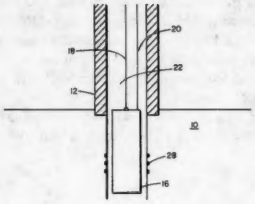
(c) igniting said propellant thereby generating energy and pressure sufficient to initiate simultaneous multiple vertical fractures while freely flowing said fluid upwardly in said wellbore which minimizes damage to said housing means and propellant igniting means due to a drag reducing effect along the fluid/solid interfaces in the wellbore's flow system resultant from the concentration of polymer utilized.

4,982,792

METHOD TO REDUCE MOVEMENT OF A CPF DEVICE VIA A SHEAR-THICKENING FLUID

William C. Hunt, III, Farmers Branch, and Craig H. Phelps, Carrollton, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 29, 1989, Ser. No. 459,118
Int. Cl.[5] E21B *43/263*
U.S. Cl. 166—299 5 Claims



1. A method for increasing drag forces on a suspended propellant housing means and a propellant igniting means within a wellbore during controlled pulse fracturing comprising:

(a) directing a shear-thickening fluid into a wellbore which fluid is of a height sufficient to submerse said housing means and igniting means where compounds contained in said fluid are of a concentration sufficient to thicken the fluid by forces generated upon the ignition of a propellant;

(b) suspending said housing means with a propellant therein and the igniting means into said wellbore and fluid near a formation's productive interval; and

(c) igniting said propellant thereby generating energy and pressure sufficient to initiate simultaneous multiple radial fractures while forcing said fluid upwardly in said wellbore thereby thickening said fluid which restricts movement of the housing and ignition means and minimizes damage thereto.

4,982,793

CROSSLINKABLE CELLULOSE DERIVATIVES

Marlin D. Holtmyer; Charles V. Hunt, and Weldon M. Harms, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 10, 1989, Ser. No. 322,155
Int. Cl.[5] E21B *43/04, 43/25, 43/26*
U.S. Cl. 166—305.1 26 Claims

1. A method for treating a subterranean formation comprising:

preparing a treating fluid composition with or without a particulate agent by admixing an aqueous liquid, a cellulose ether derivative consisting essentially of the reaction product of a cellulose ether with a ceric salt, said reaction occurring under acidic conditions and at a temperature in the range of from about 20° to about 60° C. and a crosslinking agent; and

injecting said treating fluid composition into said subterranean formation through a wellbore.

5. A method of treating a subterranean formation comprising:

preparing a treating fluid composition with or without a particulate agent by admixing an aqueous liquid, a cellulose ether derivative that is chemically modified by reacting under acidic conditions said cellulose ether derivative with a vinyl phosphonic acid and a ceric salt, and a crosslinking agent; and

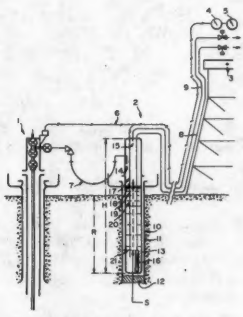
injecting said treating fluid composition into said subterranean formation through a wellbore.

4,982,794

APPARATUS FOR OIL/GAS SEPARATION AT AN UNDERWATER WELL-HEAD

Jean-Jacques Houot, Sartrouville, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Mar. 28, 1989, Ser. No. 329,596
Int. Cl.[5] E21B *43/36*
U.S. Cl. 166—357 5 Claims



1. An underwater installation for the production of hydrocarbons, comprising:

at least one working wellhead;

an oil/gas separator comprising a vertically elongated body;

a lined pit sunk in the sea bottom close to the well, wherein said separator is partially housed in said pit by a degree such that the height of the separator does not exceed that of the wellhead, whereby said separator is removable from said pit; and

a pump for discharging liquid in said body adjacent the bottom thereof, wherein the length of said body is sufficient that said pump may be positioned in said body such that said pump is always immersed in oil despite normal fluctuations in the height of the oil.

4,982,795

METHOD AND APPARATUS FOR SUPPORTING ONE TUBULAR MEMBER WITHIN ANOTHER

Christopher R. King, Amberley, England, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 3, 1989, Ser. No. 431,521
Claims priority, application European Pat. Off., Nov. 7, 1988, 8826005.4
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—382 4 Claims

1. An apparatus for supporting a tubular member such as a

casing string within another tubular member such as a wellhead, wherein there is an annular space between the members, comprising

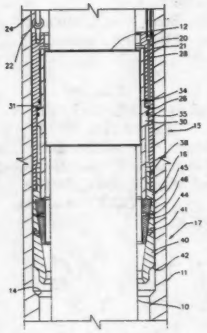
a generally tubular tool which can be lowered into the annular space between said members,

a slip carrier supported from said tool and a slip assembly carried by said slip carrier,

said slip assembly including

a slip bowl which can be supported against one of said tubular members and

a plurality of angularly spaced slip elements which can be urged into wedging engagement between said slip bowl



and the other tubular member, the slip elements normally being supported by said slip carrier in a non-engaged position,

shear pins releasably connecting the slip elements to the slip carrier,

further shear pins coupling the slip bowl to the slip carrier, each such further shear pin being arranged to shear at a higher shearing force than that at which the shear pins connecting the slip elements to the slip carrier shear, and

said tool including

means operable to urge the slip elements into said wedging engagement.

4,982,796

ELECTROMAGNETIC CONFINEMENT FOR VERTICAL CASTING OR CONTAINING MOLTEN METAL

Robert J. Lari, Aurora; Walter F. Praeg, Palos Park, and Larry R. Turner, Naperville, all of Ill., assignors to ARCH Development Corp., Chicago, Ill.

Filed Oct. 18, 1988, Ser. No. 259,387

Int. Cl.[5] B22D *27/02*

U.S. Cl. 164—467 **23 Claims**

1. An apparatus for confining molten metal to a region including:

a magnet having a top and a bottom, and a central aperture which is broadly elliptical connecting said top and said bottom,

said magnet surrounding and defining a central region in which an alternating magnetic field generated by said magnet varies as

$$B_y=(2\mu o\rho gy)^{\frac{1}{2}}$$

where B_y is the vertical component of the magnetic field generated by said magnet at the boundary of said region, y is the distance measured downward from the top of the region, ρ is the metal density, g is the acceleration of gravity and μ_o is the permeability of free space,

wherein said magnet is comprised of:

an upper pole;

a lower pole;

a yoke connecting said upper pole and said lower pole; and

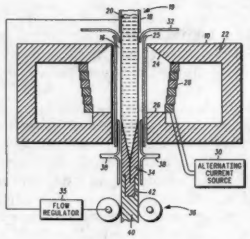
a coil adjacent said yoke, said coil capable of being connected to an alternating electric current source whereby a current carried by said coil is capable of magnetizing said yoke and said upper and said lower poles, and,

wherein the turns of said coil are located and shaped to conform to a line of constant vector potential of the magnetic field generated by said magnet, and the faces of said upper pole and said lower pole are located and shaped to conform to a line of constant scalar potential of the magnetic field generated by said magnet.

10. A method for confining molten metal to a region comprising the steps of:

maintaining an alternating magnetic field that defines a region having a vertical boundary given by

$$B_y=(2\ \mu_o\ \rho gy)^{\frac{1}{2}}$$



where B_y is the vertical component of the magnetic field generated by said magnet at the boundary of said region, y is the distance measured downward from the top of the region, ρ is the metal density, g is the acceleration of gravity and μ_o is the permeability of free space,

by means of a magnet which is comprised of:

an upper pole;

a lower pole;

a yoke connecting said upper pole and said lower pole; and,

a coil adjacent said yoke, said coil capable of being connected to an alternating current source,

locating and shaping the turns of said coil to conform to a line of constant vector potential of the magnetic field generated by said magnet, and locating and shaping the faces of said upper pole and said lower pole to conform to a line of constant scalar potential of the magnetic field generated by said magnet, and

introducing said metal in liquid form to said region maintained by said magnetic field.

4,982,797

TAPE FOR HOOF REPAIR

Samuel A. Monticello, 6600 S. Lake St., Lake Charles, La. 70605

Continuation of Ser. No. 230,611, Aug. 10, 1988, Pat. No. 4,917,192. This application Feb. 20, 1990, Ser. No. 468,110

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] A01L *15/00*

U.S. Cl. 168—4 **11 Claims**

1. Method for securing a horseshoe to a hoof comprising:

applying a horseshoe to the bottom of a hoof;

initiating the cure of curable resin coated sheet means having an elongated tape configuration; and 'winding the curable resin coated sheet means around at least a portion of the

bottom of the applied horseshoe and at least a portion of the side of the hoof after initiation of cure such that the

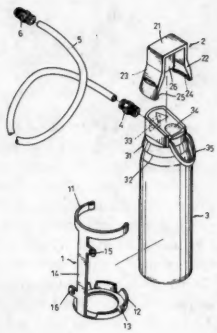
cured resin coated sheet means secures the horseshoe to the hoof.

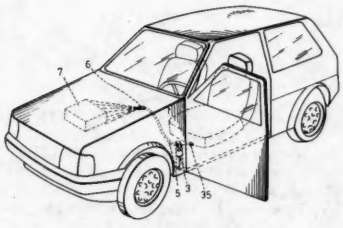
4,982,798

EXTINGUISHER FOR USE IN AN AUTOMOBILE

Hsug-Fang Wang, No. 129, Tuan-Chu Lane, Tuan-Chu Li, Chiayi City, Taiwan

Filed Jul. 12, 1989, Ser. No. 379,187
Int. Cl.[5] A62C *3/07*
U.S. Cl. 169—62 **1 Claim**





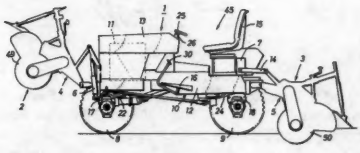
1. An extinguisher for use in an automobile including a body having a driver's compartment and an engine compartment, an engine disposed in the engine compartment, and a driver's seat disposed in the driver's compartment, said extinguisher including a barrel-like extinguisher body containing fire-extinguishing substances under pressure, a spray opening on an upper end of the extinguisher body, a hose having one end connected to the spray opening and another end located in the engine compartment, a spray nozzle connected to the other end of the hose, a push valve interposed between the interior of the extinguisher body and the spray opening for delivering the fire extinguishing substances from the interior of the extinguisher through the spray opening and the hose to the nozzle in response to an actuating force, an actuating device having a movable member biased for movement toward the push valve for applying an actuating force to open the valve, a removable safety lock mounted between the movable member and the push valve to prevent accidental actuation of the push valve, and means for mounting the extinguisher in the automobile body in a location such that the safety lock can be removed by a person in the driver's seat to permit actuation of the push valve, wherein said extinguisher body includes a skirt-like upper end portion and the actuating device comprises a pressing member connected rearwardly to said skirt-like portion, said pressing member being made of metal and including two generally downward extending hooks having curved lower ends for resiliently engaging a lower end of said skirt-like portion, and said movable member being a spring reed extending downward from said pressing member to press against said push valve so as to open said valve, and wherein said hooks can be pulled outward to remove said pressing member from said extinguisher body.

4,982,799

TRACTOR EQUIPPED WITH WORKING IMPLEMENTS

Hiromu Fujimoto; Nobuhide Yanagawa, and Eriya Harada, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Continuation of Ser. No. 920,778, Oct. 20, 1986, abandoned.
This application Aug. 16, 1989, Ser. No. 395,143
Claims priority, application Japan, Oct. 24, 1985, 60-238958; Nov. 13, 1985, 60-254175; Dec. 2, 1985, 60-271762
Int. Cl.[5] A01B *41/06*
U.S. Cl. 172—2 **1 Claim**



1. A tractor with working implements, which comprises
(a) a tractor body including only one single engine and only one single transmission mechanism mounted in the rear of said engine;
(b) front and rear wheels mounted in the front and rear of said tractor body;
(c) a front linkage assembly and a rear linkage assembly each mounted to pivotally lift up and down at the front and rear ends of the tractor body, respectively;
(d) front and rear cylinder units for actuating said front and rear linkage assemblies upward and downward;
(e) front and rear working implements of the same type being connected with said front and rear linkage assemblies for working said front and rear working implements in opposite directions from each other;
(f) switching means, included in said transmission mechanism, for switching a turning direction of power from said engine, and front and rear wheel transmission means for transmitting the engine power to the front and rear wheels from said switching means;
(g) front wheel clutching means, housed in said front wheel transmission means, for clutching the power to said front wheels, and rear wheel clutching means, housed in said rear wheel transmission means, for clutching the power to said rear wheels;
(h) front and rear detection means for monitoring, respectively, the front and rear implements in a working or nonworking position,
(i) means for controlling said front and rear wheel clutching means, in response to signals from said front and rear detection means, to cut the power transmission to said front wheels and transmit power only to the rear wheels

when the front implement is in a working position and the rear implement is in a non-working position and to cut the power transmission to said rear wheels and transmit power only to said front wheels when said rear implement is in a working position and said front implement is in a non-working position,

(j) steering means for steering said front and rear wheels, and

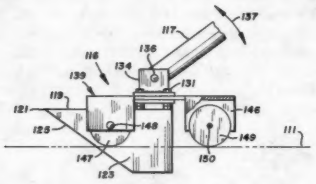
(k) means for controlling said front and rear cylinder units to raise said rear implement off the ground in a non-working position when said front implement is lowered to be in contact with the ground in a working position, and controlling said front and rear cylinder units to raise said front implement off the ground in a non-working position when said rear implement is lowered to be in contact with the ground in a working position.

4,982,800

SOD CUTTER

Robert L. Shields, P.O. Box 164, Miltona, Minn. 56354

Division of Ser. No. 409,090, Sep. 19, 1989, Pat. No. 4,934,464.
This application Feb. 27, 1990, Ser. No. 468,888
Int. Cl.[5] A01B *1/24*
U.S. Cl. 172—19 **17 Claims**



1. A tool for cutting a strip of sod from turf comprising: a cutting head for cutting a strip of sod from turf, the cutting head comprising a generally rectangular box having a top wall, a bottom wall, and a pair of downwardly directed side walls secured to opposite ends of the top wall and bottom wall, the bottom wall having a transverse front cutting edge for cutting a bottom transverse edge in a strip of sod, the side walls each having a downwardly and rearwardly inclined front cutting edge extending from the top wall to the transverse front cutting edge of the bottom wall for cutting opposite sides of the strip of sod, a pair of oppositely extending overlapping arms, fastening means extending through the arms and the top wall to secure the arms to the cutting head, each arm having an outer end, roller means attached to each outer end for laterally stabilizing the cutting head and determining the depth of cut of the cutting head, and handle means attached to the top wall of the cutting head to facilitate manual movement of the cutting head through the turf to cut a strip of sod therefrom.

4,982,801

FLEXIBLE COUPLING FOR DOWNHOLE MOTOR

Mark D. Zitka, and Gary Wells, both of Lafayette, La., assignors to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Jan. 4, 1989, Ser. No. 293,514
Int. Cl.[5] E21B *3/00*
U.S. Cl. 173—163 **18 Claims**

1. A flexible coupling for use in a downhole motor comprising:

a central shaft section having opposed first and second ends and having a longitudinal central axis;

a first intermediate shaft section having opposed first and second ends;

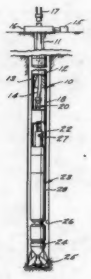
a second intermediate shaft section having opposed first and second ends;

a first outer shaft section having opposed first and second ends;

a second outer shaft section having opposed first and second ends;

a first joint pivotably interconnecting said first end of said central shaft section to said first end of said first intermediate shaft section, said pivotal interconnection of said first joint being along a first plane passing through said longitudinal axis of said central shaft;

a second joint pivotably interconnecting said second end of said first intermediate shaft section to said first end of said first outer shaft section, said pivotal interconnection of said second joint being along a second plane passing through said longitudinal axis of said central shaft, said first plane being offset 90 degrees from said second plane;



a third joint pivotably interconnecting said second end of said central shaft section to said first end of said second intermediate shaft section, said pivotal interconnection of said third joint being along a third plane passing through said longitudinal axis of said central shaft; and

a fourth joint pivotably interconnecting said second end of said second intermediate shaft section to said first end of said second outer shaft section, said pivotal interconnection of said fourth joint being along a fourth plane passing through said longitudinal axis of said central shaft, said third plane being offset 90 degrees from said fourth plane.

4,982,802

METHOD FOR STABILIZING A ROTARY DRILL STRING AND DRILL BIT

Tommy M. Warren, Coweta; Warren J. Winters, Tulso, and J. Ford Brett, Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 22, 1989, Ser. No. 441,139
Int. Cl.[5] E21B *17/00, 17/16*
U.S. Cl. 175—57 **2 Claims**

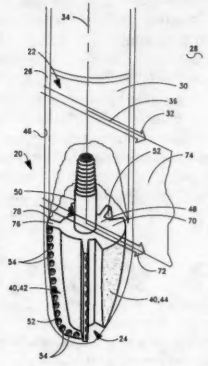
1. A method of stabilizing a drillstring and a drill bit connected in the drillstring used to drill a borehole in a material, comprising:

(a) providing in a drillstring a drill bit having a mass imbalance so when rotated an imbalance force is directed to an outwardly axially extending radial plane towards a smooth, bearing portion on the drill bit;

(b) providing in the drillstring above the drill bit a tubular member having a structure so when rotated an imbalance force is directed in an axially extending radial plane;

(c) aligning the drill bit and the tubular member so that the imbalance forces of the drill bit and the tubular member are in the same axially-extending radial plane; and

(d) rotating the aligned drill bit and tubular member to force the smooth bearing portion of the drill bit into sliding



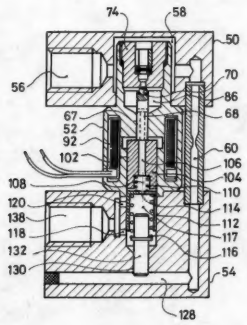
contact with a wall of the borehole and drill the borehole in the material.

4,982,803

MODULATOR AND POWER-ASSISTED STEERING CIRCUIT COMPRISING SUCH A MODULATOR

Gilbert Kervagoret, Argenteuil, France, assignor to Bendix Europe Services Techniques, Drancy, France

Filed May 18, 1990, Ser. No. 525,001
Claims priority, application France, May 31, 1989, 89 07144
Int. Cl.[5] B62D *5/08*
U.S. Cl. 180—132 **4 Claims**



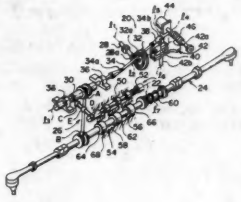
1. A modulator intended for diverting a specific flow of fluid under high pressure from a supply circuit of a hydraulic motor, said modulator comprising, between a fluid inlet and a fluid outlet, a solenoid control valve and a flow regulator, said flow regulator being composed of a bore, in which a sliding sleeve pierced with a restriction defines an inlet chamber and a regulating chamber, in a wall of which said fluid outlet is made, and a spring arranged in said regulating chamber and opposing the sliding of said sleeve, a skirt of said sleeve capable of closing said fluid outlet, said solenoid valve being a progressively acting solenoid valve, a shutter of which is capable of approximately closing communication between said fluid inlet and said inlet chamber of the regulator as a function of a signal applied to said solenoid valve, and said spring bearing on a piston which closes said regulating chamber and behind which is formed a reaction chamber communicating with said fluid inlet.

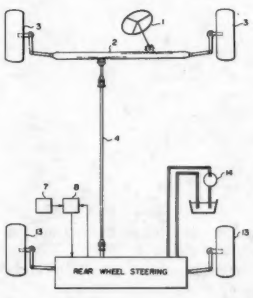
4,982,804

VEHICLE STEERING SYSTEM

Hirotaka Kanazawa; Yoichi Takeda; Yukio Noguchi, all of Hiroshima; Isamu Chikuma, Maebashi; Satoru Shimada, Maebashi, and Kazuo Chikaraishi, Maebashi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan and Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 315,116
Claims priority, application Japan, Feb. 29, 1988, 63-47252; Apr. 26, 1988, 63-103186
Int. Cl.[5] B62D *5/06, 7/14*
U.S. Cl. 180—140 **19 Claims**





1. A steering system for a vehicle comprising

a wheel turning rod which is displaced to turn wheels connected thereto,

a hydraulic power cylinder means which has first and second oil chambers for exerting a hydraulic pressure on the wheel turning rod for displacing the wheel turning rod in one direction when a hydraulic pressure is fed to the first oil chamber and for exerting a hydraulic pressure on the wheel turning rod for displacing the wheel turning rod in the other direction when a hydraulic pressure is fed to the second oil chamber,

a hydraulic switching valve having a valve housing and a valve member slidably disposed in the valve housing and which is displaced with respect tot he valve housing from a neutral position in one direction to feed the hydraulic pressure to the first oil chamber of the hydraulic power cylinder means, and in the other direction to feed the hydraulic pressure to the second oil chamber of the hydraulic power cylinder means,

a steering ratio changing mechanism which has an output displacement member which is displaced in response to operation of a steering wheel, and which can change a steering ratio which is the ratio of the amount of displacement of the output displacement member to the degree of turning of the steering wheel, and

a displacement transmission means which is operatively connected to the output displacement member, the valve member and the wheel turning rod for displacing the valve member in a predetermined direction in response to a displacement of the output displacement member as controlled by the steering ratio changing mechanism and for subsequently displacing the valve member in the direction opposite to the predetermined direction in response to a displacement of the wheel turning rod generated by the hydraulic power cylinder means caused by the preceding displacement of the valve member, so that the wheel turning rod is displaced in response to displacement of the output displacement member with the valve member being hardly displaced.

4,982,805

CONSTANT-SPEED CRUISE CONTROL APPARATUS FOR A VEHICLE

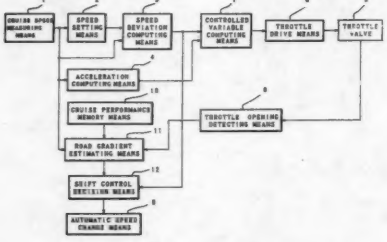
Yasuo Naitou, and Akihiko Mori, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,664

Claims priority, application Japan, Oct. 22, 1987, 62-268455; Oct. 22, 1987, 62-268456

Int. Cl.[5] B60K *31/04*

U.S. Cl. 180—179 **1 Claim**



1. A constant-speed cruise control apparatus for a vehicle comprising:

a means for measuring an actual cruise speed for a vehicle comprising:

a means for setting a target speed,

a means for computing a speed deviation of said cruise speed for said target speed,

a means for computing an acceleration of the vehicle on the basis of said cruise speed,

a throttle valve for controlling a driving force of the vehicle,

a drive means for driving said throttle valve,

a means for computing a controlled variable of said drive means so as to reconcile said cruise speed with said target speed,

a means for detecting the opening of said throttle valve,

an automatic speed change means capable of automatically shifting up or shifting down a transmission of the vehicle,

a means for storing therein cruise performance characteristics on at least two roads having different gradients from each other expressed in terms of a relationship between the cruise speed and the opening of said throttle valve,

a means for estimating the gradient of a road on which the vehicle cruises on the basis of said cruise speed, the detected opening of said throttle valve and said stored cruise performance characteristics in accordance with:

$$\tan \delta_n = \frac{(\tan \delta_1 - \tan \delta_2)(\theta_n - \theta_2)}{\theta_1 - \theta_2} + \tan \delta_2$$

where:

$\tan \delta_1$ is a road gradient for a throttle valve opening θ_1 at said actual cruise speed,

$\tan \delta_2$ is a road gradient for a throttle valve opening θ_2 at said actual cruise speed,

$\tan \delta_n$ is the estimated gradient of the road on which the vehicle is cruising, and

a control means which outputs a shift-down command to said automatic speed change means when the absolute value of said speed deviation is more than a first value, or said estimated gradient is more than a second value, and after said shift-down command is output, outputs a shift-up command to said automatic speed change means when the absolute value of said speed deviation is less than a third value and said gradient is less than a fourth value.

4,982,806

ANTI-LOCK CONTROL SYSTEM FOR MOTOR VEHICLES

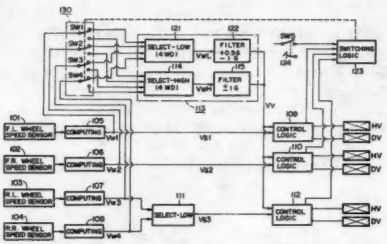
Hiroyuki Yoshizawa, Iwaki; Satoru Eguchi, Kitasaitama; Haruki Shimanuki, Kasukabe; Katsuya Miyake, Konosu, and Yoshiaki Hirobe, Minamisaitama, all, Japan, assignors to Akebono Brake Industry Co., Ltd., Japan

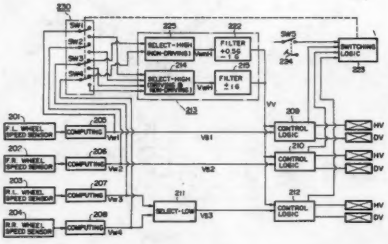
Filed Feb. 28, 1990, Ser. No. 486,248

Claims priority, application Japan, Feb. 28, 1989, 1-45190

Int. Cl.[5] B60K *31/00*; B60T *8/00*

U.S. Cl. 180—197 **16 Claims**





1. An anti-lock control system for a 4WD motor vehicle, comprising:

a computed vehicle speed computing means (**113**), and means (**109**; **110**; **112**) for starting reduction of brake hydraulic pressure;

said computed vehicle speed computing means (**113**) including select-high means (**114**) for selecting the highest one of four wheel speeds, and a first limit means (**115**);

said select-high means (**114**) being arranged to select the highest one VwH of the four wheel speeds Vw1 to Vw4;

said first limit means (**115**) being arranged to provide, as computed vehicle speed Vv, a speed having acceleration and deceleration follow-up limits with respect to the high-

est wheel speed VwH, selected by said select-high circuit (114), set at predetermined values;

said computed vehicle speed Vv, which is provided by said first limit means (115) being set up so as to increase linearly with an increasing gradient representing said acceleration follow-up limit when Vv<VwH and decrease linearly with a decreasing gradient representing said deceleration follow-up limit when Vv>VwH;

said anti-lock control system being characterized in that:

said computed vehicle speed computing means (113) further includes select-low means (121), and a second limit means (122);

said select-low means (121) is arranged to select the lowest one VwL of the four wheel speeds Vw1 to Vw4;

said second limit means (122) is arranged to provide, as the computed vehicle speed Vv, a speed having acceleration and deceleration follow-up limits with respect to the lowest wheel speed VwL, selected by said select-low means (121), set at predetermined values, said second limit means (122) being also arranged such that only the acceleration follow-up limit with respect to said lowest wheel speed VwL set at a value lower than the acceleration follow-up limit with respect to said highest wheel speed VwH which is set up in said first limitr means (115);

said computed vehicle speed Vv, which is provided by said second limit means (122), being set up so as to increase linearly with an increasing gradient representing said acceleration follow-up limit when Vv<VwL and decrease linearly with a decreasing gradient representing said deceleration follow-up limit when Vv>VwL; and

change-over means (123; 130) are provided, said change-over means (123; 130) being arranged such that the computed vehicle speed Vv is provided by said select-low means (121) and said second limit means (122) when brake apparatus is not operated or when no anti-lock control is effected, while when the brake apparatus is operated or when anti-lock control is effected, said computed vehicle speed Vv is provided by said select-high means (114) and said first limiy means (115).

4,982,807

DRIVE-SLIP CONTROL DEVICE FOR MOTOR VEHICLES

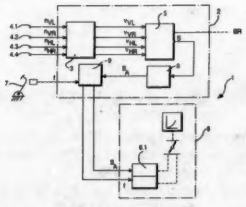
Walter Hilburger, Nürtingen, and Siegfried Ochs, Remshalden, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Sep. 27, 1989, Ser. No. 413,211

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1988, 3833588

Int. Cl.[5] B60K *31/00*

U.S. Cl. 180—197 **2 Claims**



1. Drive-slip control apparatus for a motor vehicle having driven and non-driven wheels, and engine and an accelerator, comprising:

Sensor means for measuring separately rotational speed of each of said driven and non-driven wheels;

Spin signal generating means, responsive to output signals from said sensor means, for detecting a difference between the rotational speed of said driven and said non-driven wheels, and for generating a spin signal when said difference exceeds a predetermined threshold value;

Drive-Slip control means for generating an engine control target signal in response to said spin signal;

Engine control means for reducing and increasing power of said engine in a controlled manner in response to said engine control target signal;

Accelerator target control means for generating an accelerator target signal in response to a position of said accelerator pedal;

Memory means for detecting and storing, for a predetermined time interval, an instantaneous value of said engine control target signal, whenever said accelerator target signal equals or falls below said engine control target signal;

Said engine control means being adapted to cause speed of said engine to increase in response to said engine control target signal if said accelerator target signal thereafter increases to a value equal to or exceeding said stored instantaneous value of said engine control target signal within said predetermined time interval, and otherwise to cause the speed of said engine to increase in response to said accelerator target signal.

4,982,808

VISCOUS SHEAR COUPLING

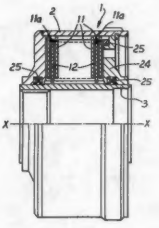
Herbert Taureg, Hennef, and Heinz Klein, St. Augustin, both of Fed. Rep. of Germany, assignors to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

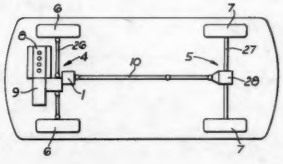
Continuation of Ser. No. 149,139, Jan. 27, 1988, abandoned. This application Dec. 19, 1989, Ser. No. 455,850

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702299

Int. Cl.[5] F16D *35/00*

U.S. Cl. 180—233 **6 Claims**





1. A viscous shear coupling, comprising a housing; a hub mounted within the housing for rotation relative to the housing about an axis in first and second opposite directions; a viscous liquid in the housing; and first and second sets of annular plates in the housing with each of said plates having a radially outer periphery and a radially inner periphery, the plates of the first set being mounted on and rotatable with the housing, spacing rings between the outer peripheries of adjacent plates of said first set, spacing said adjacent plates apart, said plates of said first set being interleaved with the plates of the second set

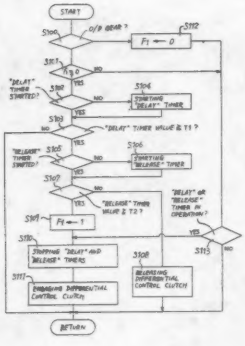
which are mounted on and rotatable with the hub, each plate in the first set of plates having a plurality of circumferentially spaced first slots each having an inner end at least adjacent to the inner periphery of the plate and extending outwardly from said axis and each plate in the second set of plates having a plurality of circumferentially spaced second slots having outer ends at least adjacent to the outer periphery of the plate and extending inwardly towards said axis, lengths of the first and second slots from said inner and outer ends respectively being such that the slots overlaps so that parts of said first slots move into and out of axial alignment with parts of said second slots upon rotation of the hub relative to the housing, one of said inner and outer ends of each slot in each plate of at least one of said sets of plates being displaced circumferentially of a radius of said plate passing through the other one of said inner and outer ends, such that in said first direction of rotation of said hubs relative to the housing the axially aligned parts of the slots of adjacent plates of said first and second sets move inwardly towards said axis to pump said viscous liquid towards said axis thus minimizing the torque transmitted by the coupling, and in said second direction of rotation of the hub relative to the housing the axially aligned parts of the slots of adjacent plates of said first and second sets move outwardly away from said axis to pump said viscous liquid outwardly from said axis to maximize the torque transmitted by the coupling.

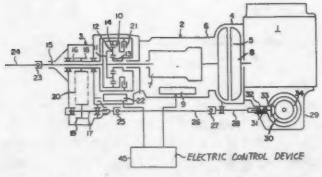
4,982,809

METHOD AND APPARATUS FOR CONTROLLING 4-WHEEL DRIVE SYSTEM FOR A MOTOR VEHICLE

Yasunari Nakamura, Nagoya; Kojiro Kuramochi, Okazaki, and Teruo Akashi, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin AW Co., Ltd., both of Aichi, Japan

Filed Sep. 22, 1988, Ser. No. 247,493
Claims priority, application Japan, Sep. 29, 1987, 62-244593
Int. Cl.[5] B60K *17/34*
U.S. Cl. 180—248 **14 Claims**





1. A method of controlling a 4-wheel drive system of a motor vehicle having a pair of front wheels and a pair of rear wheels and a power transmission, the 4-wheel drive system including clutch means having input and output elements which are rotatable relative to each other with a controlled amount of engagement therebetween, so as to control a ratio of distribution of a torque from the power transmission to front and rear wheels, said method comprising the steps of:

determining whether said power transmission is commanded to be shifted from a first gear position to a second gear position whose speed ratio is different from that of said first gear position; and

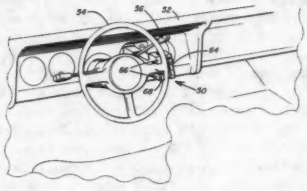
if said power transmission is commanded to be shifted to said second gear position, temporarily placing said clutch means in a fully disengaged position thereof for a predetermined time duration to thereby improve durability of said clutch means.

4,982,810

VEHICLE ANTI-THEFT DEVICE

Malcolm D. Toy, 425 Willow Pl., Pittsburgh, Pa. 15218

Filed Jul. 12, 1989, Ser. No. 378,695
Int. Cl.[5] B60R *25/02*
U.S. Cl. 180—287 **20 Claims**



1. An anti-theft device for a vehicle having a steering wheel and a dashboard comprising:

a recess formed within said dashboard to completely receive a locking bar;

a locking bar movable between an idle position wherein said locking bar is completely retracted into said dashboard recess when said anti-theft device is not in use and an active position wherein said locking bar is partially withdrawn from said dashboard when said anti-theft device is in use;

said locking bar having a steering wheel contacting end portion that prevents rotation of said steering wheel when said locking bar steering wheel contacting end portion is in contact with said steering wheel; and

lock means associated with said locking bar to maintain said steering wheel contacting end portion locked into contact with said steering wheel when said anti-theft device is in use.

4,982,811

FLUID DRIVEN TORSIONAL DIPOLE SEISMIC SOURCE

Harry C. Hardee, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1989, Ser. No. 390,810
Int. Cl.[5] G01V *1/40*
U.S. Cl. 181—106 **23 Claims**

1. A fluid operated downhole torsional seismic source, which is operable under downhole compressible fluid, comprising,

a cylindrical sleeve

a first pair of openings in said cylindrical sleeve;

a second pair of openings in said cylindrical sleeve;

two fixed vanes wherein each of said vanes is securely attached to the interior of said sleeve, each of said vanes

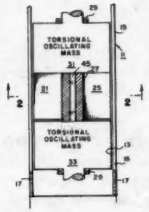
being adjacent to one of said openings of said first pair of openings whereby said fixed vanes form two chambers within said sleeve;

a first and a second porting block, each being attached to the interior portion of said sleeve adjacent to one of said first pair of openings, thereby forming channels into each of said chambers between each of said fixed vanes and said first and second porting blocks;

a movable spindle being located centrally within said sleeve and fixed between bearings;

two movable vanes being rigidly supported by said central movable spindle wherein said movable vanes separate each of said chambers into dual sectors;

a first mass located at the top of said central spindle above



said sleeve and connected to said spindle and said movable vanes;

a second mass located at the bottom of said central spindle below said sleeve and connected to said spindle and said movable vanes;

means for clamping said source to a bore hole; and

means, connected to said sleeve, for supplying a pulsating flow of pressurized compressible fluid into said cylindrical sleeve through said channels formed by said porting blocks and against said movable vanes, thereby causing reciprocal rotation of said movable vanes, said spindle, and said masses in alternating directions, and generating horizontally propagating, horizontally polarized shear waves that are transmitted through the clamping means into the surrounding medium.

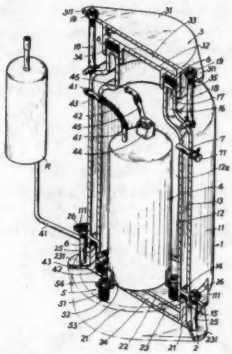
4,982,812

NOISE-PREVENTIVE MEANS FOR COMPRESSOR USED IN AIR CONDITIONER

Min-su Hwang, P.O. Box 10160, Taipei, Taiwan

Filed Oct. 24, 1989, Ser. No. 426,007
Int. Cl.[5] G10K *11/00*
U.S. Cl. 181—202 **1 Claim**

1. A noise-preventive apparatus for a compressor used in an air conditioner comprising: a double-wall vacuum jacket comprised of a bottom jacket secured with said compressor thereon, a main jacket sealably mounted on said bottom jacket and disposed around said compressor, and an upper, jacket sealably mounted on said main jacket as a covering for said double-wall vacuum jacket; said main jacket including an inner cylindrical wall plate defining a central chamber in combination with said upper and bottom jackets in which said central chamber is evacuated for forming a vacuum by means of a venting pipe extending through said main jacket, an outer cylindrical wall plate formed outside the inner wall plate an defining a cylindrical vacuum chamber between said inner and outer wall plates, an annular bottom plate formed on a lower portion of said main jacket for closing a lower portion of said cylindrical vacuum chamber, a lowest annular groove formed on a bottom surface of said annular bottom plate, and an upper cylindrical extension formed on an upper portion of said main jacket having an annular top plate closing an upper portion of said cylindrical vacuum chamber; said bottom jacket including: a lower cylindrical extension wall plate engageable with said lowest annular groove of said main jacket as and being packed by a packing ring inserted in said annular groove and sealed by a sealant filled in said groove, a compressor-mounting base plate confined within said lower cylindrical extension wall plate for mounting said compressor thereon, a lowest bottom plate confined within said lower cylindrical extension wall plate under said base plate and defining a lower circular vacuum chamber between said base plate and said lowest bottom plate, and a bottom flange having bolts secured to a lower flange formed on said outer wall plate of said main jacket for connecting, said main jacket to said bottom jacket; and said upper jacket including: an uppermost plate having a top flange secured to said main jacket by bolts fixed on said main jacket, a cover plate confined within an upper cylindrical extension wall plate protruding downwardly from said upper-



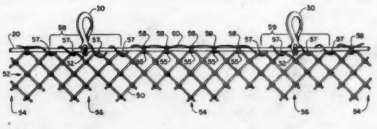
most plate, an upper vacuum chamber defined between said uppermost plate, said cover plate and said upper extension wall plate, and an upper annular groove formed on a perimeter of a bottom surface of said cover plate engageable with said upper cylindrical extension formed on said main jacket and being packed by a packing ring inserted in said upper annular groove and sealed by a sealant filled in said groove, whereby due to the vacuum formed in said central chamber defined by said inner cylindrical wall plate of said main jacket in combination with said upper and bottom jackets, and the vacuum formed between respective plates of said main jacket, said bottom jacket and said upper jacket, so sound or noise will be transmitted from operation of said compressor, and thereby said apparatus forming a noise-preventive means for suppressing noise from said compressor for noise prevention function.

4,982,813

SHOCK ABSORBING SAFETY NET

John F. Starr, Middle Haddam, Conn., assignor to SINCO, Incorporated, East Hampton, Conn.

Filed Jun. 8, 1990, Ser. No. 535,182
Int. Cl.[5] E04G *21/32*; A62B *1/22*
U.S. Cl. 182—138 **17 Claims**



1. A safety net comprising:

border means comprising a generally continuous perimeter

member extending longitudinally to define a peripheral flexible border;

mounting means attached at longitudinally spaced positions of said perimeter member for mounting said safety net to an external structure;

mesh net means comprising a diamond mesh net comprising a peripheral band of alternating arrays of first and second diamond meshes having respective diamond points;

connecting means comprising a connecting cord for lashing said first diamond points to said perimeter member at fixed positions thereof and lacing said second diamond points to said perimeter member so as to permit limited longitudinal displacement of said second diamond points along said perimeter member,

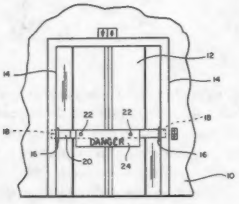
so that an impact load against said safety net results in a generally V-shaped deformation of said perimeter member at the vicinity of a said mounting means and at least some of said second diamond meshes generally elongate to a greater degree than said first diamond meshes to at least partially absorb the impact of said load.

4,982,814

ELEVATOR SAFETY BARRICADE

Daniel J. Hussey, 115 Bing Blvd., Bridgeton, Mo. 63044

Filed Oct. 5, 1989, Ser. No. 417,436
Int. Cl.[5] B66B *13/00*
U.S. Cl. 182—230 **6 Claims**



1. An elevator safety barricade adapted to prevent inadvertent entry into an elevator shaft consisting essentially of: a pair of opposed pockets in the opposite side plates of an elevator opening, said opposed pockets being recessed in space back of the respective opposite side plates, a pair of overlapping restraining bars adapted for an opposing end of each of said restraining bars to be insertable into and mate with said opposed pockets, and, means for holding said overlapping restraining bars in rigid abutting relationship in order to provide a barricade to prevent inadvertent entry into said elevator shaft.

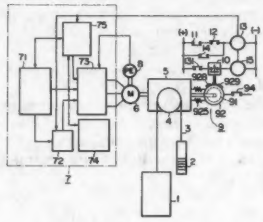
4,982,815

ELEVATOR APPARATUS

Noboru Arabori; Hideaki Takahashi, both of Katsuta; Yoshio Sakai, Ibaraki; Tsutomu Sano, Katsuta; Masao Nakazato, Katsuta; Masakatsu Tanaka, Katsuta; Katutaro Masuda, Katsuta; Mitsuo Saito, Katsuta, and Yuji Toda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,910
Claims priority, application Japan, Nov. 7, 1988, 63-279275
Int. Cl.[5] B66B *5/02*
U.S. Cl. 187—105 **11 Claims**

1. In an elevator apparatus including an electric motor for driving said elevator, an elevator cage lifted or lowered by said electric motor, and a brake device for stopping and retaining an elevator driving system, the improvement comprising a malfunction detecting means operative in response to the appli-



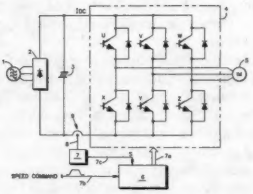
cation of a torque to a retainer section of said brake device during the lifting or lowering of said elevator cage.

4,982,816

SPEED CONTROL SYSTEM FOR ELEVATORS

Kazuhiko Doi, Narita, and Yasutami Kito, Tokyo, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 18, 1989, Ser. No. 339,737
Claims priority, application Japan, Apr. 18, 1988, 63-94898
Int. Cl.[5] B66B *1/30*
U.S. Cl. 187—119 **3 Claims**



1. A speed control system for an elevator employing an induction motor driven by an inverter, characterized in that it comprises

a slip operation circuit, responsive to a sensed DC signal having a magnitude indicative of DC power input to the inverter, for providing a slip frequency signal; and

a control device, responsive to a dictated speed profile signal and to said slip frequency signal, for determining output torque and load torque of the motor from said slip frequency and for determining the actual rotating speed of the motor from said torque determinations for providing inverter frequency and voltage control signals so as to make the actual speed identical to that dictated by said dictated speed profile signal.

4,982,817

GROUP SUPERVISION APPARATUS FOR ELEVATOR SYSTEM

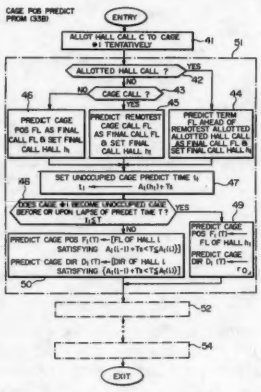
Shintaro Tsuji, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 17, 1989, Ser. No. 422,684
Claims priority, application Japan, Oct. 19, 1988, 63-263086
Int. Cl.[5] B66B *1/18*
U.S. Cl. 187—127 **6 Claims**

1. In a group-supervisory elevator system having hall call registration means for registering each hall call when a hall button is depressed, assignment means for selecting a cage to-serve from among a plurality of cages and assigning the selected cage to the hall call, and cage control means for per-

forming operation controls such as determining travelling directions of the cages, starting and stopping the cages, and opening and closing doors of the cages, and for causing the cages to respond to cage calls and the hall calls;

a group supervision apparatus for an elevator system comprising cage position means for predictively calculating cage positions and cage directions of the respective cages after the cage calls and the allotted hall calls have been successively responded to since the present point of time,


CAGE POS PREDICT PROM (53D)
ENTRY
ALLOT HALL CALL C TO CASE #I TENTATIVELY
41
51
ALLOTTED HALL CALL ?
YES
NO
42
CAGE CALL ?
43
YES
45
46
44
PREDICT CAGE POS FL AS FINAL CALL FL & SET FINAL CALL HALL h_1
PREDICT REMOTEST CASE CALL FL AS FINAL CALL FL & SET FINAL CALL HALL h_1
PREDICT TERM FL AHEAD OF REMOTEST ALLOTTED ALLOTTED HALL CALL AS FINAL CALL FL & SET FINAL CALL HALL h_1
SET UNOCCUPIED CASE PREDICT TIME t_1
$t_1 \leftarrow A_1(h_1) + T_k$
47
48
DOES CASE #I BECOME UNOCCUPIED CASE BEFORE OR UPON LAPSE OF PREDET TIME T ?
YES
49
NO
PREDICT CASE POS $F_i(T) \leftarrow$ [FL OF HALL i SATISFYING $A_1(i-1) + T_k < T \leq A_1(i)$]
PREDICT CASE DIR $D_i(T) \leftarrow$ [DIR OF HALL i SATISFYING $A_1(i-1) + T_k < T \leq A_1(i)$]
PREDICT CASE POS $F_i(T) \leftarrow$ FL OF HALL h_1
PREDICT CASE DIR $D_i(T) \leftarrow$ D_o
50
52
54
EXIT

during a predetermined time, and cage interval prediction means for predictively calculating intervals of the respective cages to arise after lapse of the predetermined time, on the basis of the predicted cage positions and the predicted cage directions, wherein the cage to-serve is selected from among the plurality of cages and is assigned by said assignment means under a condition that the cage intervals predicted by said cage interval prediction means are used as one item of estimation.

4,982,818

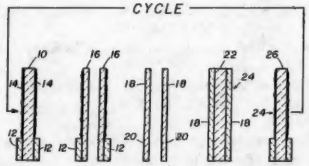
CYCLIC BRAKE DISC OVERHAUL TECHNIQUE AND STRUCTURE

James F. Pigford, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 17, 1989, Ser. No. 422,854

Int. Cl.[5] F16D *65/10;* **B23P** *7/00, 17/00;* **B21D** *1/00*

U.S. Cl. 188—73.1 **10 Claims**



1. A method for manufacturing a carbon-carbon composite friction disc from worn parts comprising:

radially splitting a worn carbon disc into equal disc halves;

machining each disc half to a predetermined thickness dimension; and

bonding the disc halves to each side of a carbon-carbon composite core member.

4,982,819

HYDRODYNAMIC RETARDER

Masahiko Koshimo, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

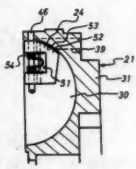
PCT No. PCT/JP88/01199, § 371 Date Jul. 20, 1989, § 102(e) Date Jul. 20, 1989, PCT Pub. No. WO89/05410, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 25, 1988, Ser. No. 391,610

Claims priority, application Japan, Dec. 3, 1987, 62-306567

Int. Cl.[5] F16D *52/06*

U.S. Cl. 188—296 **5 Claims**



1. A hydrodynamic retarder for a motor vehicle comprising:

a housing fixed to said vehicle,

a stator wheel and a rotor wheel provided internally of said housing and facing each other to define a toroidal space therebetween,

said rotor wheel being fixed for rotation with an output shaft of said motor vehicle,

said stator wheel being fixed to said housing and including a plurality of first blades fixed to said stator wheel and having an edge facing said rotor wheel,

a notch in said edge of selected ones of said first blades,

a plurality of second blades with each of said second blades pivotally mounted in one of said notches of a first blade on a pin extending in the same direction as said edge of said first blade with one end of the pin seated in said first blade and a second end of said pin seated in said stator wheel,

means for biasing said second blades to a first position to close passages between adjacent ones of said first blades to a low pressure fluid flow and movable in response to a higher pressure fluid flow to a second position permitting fluid flow between said adjacent ones of said first blades,

a source of working fluid for providing said higher pressure fluid flow, and

fluid passages between said source of working fluid and said rotor wheel and between said stator wheel and said source of working fluid to selectively pass said working fluid to said rotor wheel, whereby said plurality of second blades, said pins and said means for biasing said second blades are all provided internally of said toroidal space defined by said stator wheel.

4,982,820

CONTAINER FOR USE BY TRAVELLING SALES PERSON

Alan M. Scott, Dublin, Ireland, assignor to Eolas, Dublin, Ireland

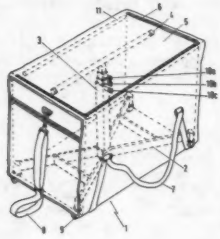
Continuation of Ser. No. 282,125, Dec. 19, 1985, abandoned. This application May 30, 1990, Ser. No. 530,470

Int. Cl.[5] A45C *3/00, 5/14*

U.S. Cl. 190—16 **6 Claims**

1. A container, for example a bag or suitcase, for use by a travelling sales person in transporting goods from one retail outlet to another provided with a display stand movable between a collapsed state within the bag for transportation purposes and an erect state projecting from the bag for display purposes, in which the display stand is a garment display stand comprising a base, a multisectional vertical column, locking means biassed into a locking position for securing each of the sections of the vertical column to a next section when the vertical column is brought from a collapsed contracted state to

an erect extended state, and a horizontal rail mounted centrally at the top of the column, and the vertical column is telescopic between an erect extended state and a collapsed contracted



state whereby the display stand may be brought into the erect extended state by an operator by a single-handed continuous movement.

4,982,821

FRICTION DEVICE OF LOCKUP CLUTCH

Teruhiko Tanaka, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

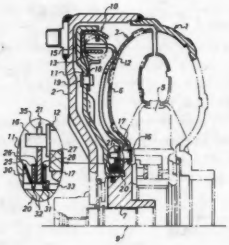
PCT No. PCT/JP88/01202, § 371 Date Aug. 2, 1989, § 102(e) Date Aug. 2, 1989, PCT Pub. No. WO89/05415, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 28, 1988, Ser. No. 393,910

Claims priority, application Japan, Dec. 7, 1987, 62-310355; Dec. 7, 1987, 62-310356

Int. Cl.[5] F16D *33/18*

U.S. Cl. 192—3.29 **9 Claims**



1. A friction device of a lockup clutch comprising an annular plate-shaped piston pressure connected to an input portion of a torque converter, an annular driven plate coupled to a turbine of said torque converter, and damper springs for coupling said piston and said driven plate in a circumferential direction, in which a friction mechanism is disposed between an inner circumferential portion of said piston and a hub flange of said turbine, and said friction mechanism has a first friction member not rotatable relative to said turbine hub and a second friction member not rotatable relative to said piston, said first and second friction members being pressed into engagement with each other for producing friction between said friction members by relative rotation between said piston and said turbine hub.

4,982,822

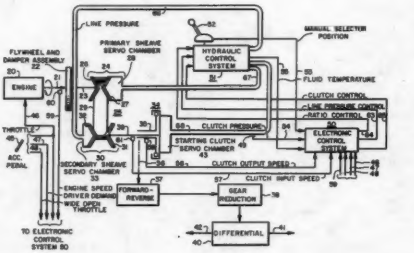
CONTROL SYSTEM FOR CONTROLLING THE LINE PRESSURE IN A CONTINUOUSLY VARIABLE TRANSMISSION

Werner P. Petzold, Harwood Heights, Ill., and William P. Umlauf, Schererville, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 1, 1986, Ser. No. 936,527

Int. Cl.[5] B60K *41/22*

U.S. Cl. 192—3.58 **20 Claims**



1. A line pressure control system for controlling the line fluid pressure in a continuously variable transmission, in which fluid under line pressure is controlled to produce an adjustable clutch fluid pressure for operating a clutch to transfer drive torque from an engine and through the transmission to an associated drivetrain, including a pressure transducer operable to sense the clutch pressure applied to the clutch, and having a closed loop clutch controller which responds to the sensed clutch pressure to effect closed loop control of the clutch, said control system comprising:

a closed loop line pressure controller, including the closed loop clutch controller, which responds to the clutch pressure sensed by the pressure transducer after the clutch is fully applied and is locked up, and becomes operable to effect closed loop control of the line pressure to a desired setpoint.

15. A line pressure control system for controlling the line fluid pressure in a continuously variable transmission, comprising:

an open loop controller for establishing the line pressure at a level higher than that called for by a desired line pressure setpoint;

and a closed loop controller, including the open loop controller, for effectively lowering the line pressure so that it will be equal to the setpoint.

4,982,823

BIDIRECTIONAL CLUTCH FOR CURTAIN DRAWING MECHANISM

Yutaka Yoshida, Saitama, Japan, assignor to Kabushiki Kaisha Yokota, Tokyo, Japan

Filed May 31, 1989, Ser. No. 359,716

Int. Cl.[5] F16D *41/07*

U.S. Cl. 192—38 **4 Claims**

1. A bidirectional clutch for a pulley drive, comprising:

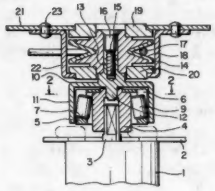
a rotary cam adapted to be mounted on an upright drive shaft of a motor;

a pulley body having a drum portion having a face coaxial with the rotary axis of said rotary cam and spaced from said rotary cam;

a plurality of elongated rotatable bodies positioned in a space between said drum portion and said rotary cam; and

a guide member for rotatably supporting said elongated rotatable bodies in said guide member for normally being tilted in a position in which said rotatable bodies are out of

engagement with said drum portion and being movable to a position where said rotatable bodies tightly engage with said drum portion, a face of said rotary cam being opposed to said drum portion having a cam portion which, upon



said cam being rotated relative to said rotatable bodies and said drum portion, moves said rotatable bodies toward and presses them into engagement with said drum portion to transmit the rotational force of the motor to said drum portion and said pulley body.

4,982,824

FLUID CLUTCH

Yasunobu Fukatani, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

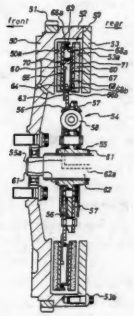
PCT No. PCT/JP88/00247, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988, PCT Pub. No. WO88/07635, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 9, 1988, Ser. No. 304,988

Claims priority, application Japan, Mar. 30, 1987, 62-78479

Int. Cl.[5] F16D *25/0635, 25/04*

U.S. Cl. 192—85 AB **4 Claims**



1. A fluid clutch assembly comprising a flywheel to which engine power is transmitted, an annular plate secured to said flywheel with a fixed distance therebetween, an output shaft in axial alignment with the axis of rotation of said flywheel, a clutch disc having a splined hub splined to said output shaft, snap rings at the opposite ends of said hub engaged in circumferential grooves in said output shaft and fixing said clutch disc in fixed axial position on said output shaft, said clutch disc having a clutch plate and a retaining plate, rigid annular discs on opposite sides of said clutch plate and positioned between said flywheel and said annular plate, said rigid annular discs having friction facings of friction material attached to said rigid annular discs for engagement with said flywheel and said annular plate, respectively, and fluid actuator means disposed at an outer peripheral portion of said clutch disc between said rigid annular disc and said friction facings thereon for engaging and disengaging said friction facings on said rigid annular discs with said flywheel and said annular plate, respectively.

4,982,825

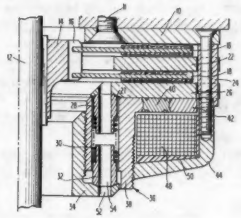
TORQUE AND AIR GAP ADJUSTMENT MECHANISM FOR SPRING ENGAGED BRAKE OR CLUTCH

T. Curran Sekella, Elmira, N.Y., assignor to Sepal, Elmira, N.Y.

Filed May 11, 1989, Ser. No. 350,506

Int. Cl.[5] F16D *13/75, 27/04, 65/42*

U.S. Cl. 192—90 **14 Claims**



1. In a spring engaged electromagnetically operated brake or clutch of the type having an air gap between friction pads associated with a rotating shaft and fixed plates mounted around the shaft, the improvement comprising an integrated assembly containing means for independent adjustment of the air gap and means for independent adjustment of brake torque, such that adjustment of the air gap does not alter brake torque, said integrated assembly comprising:

(a) an assembly housing fixedly situated about the shaft;

(b) an air gap adjustment assembly situated about the shaft, and threadedly engaged with said assembly housing;

(c) a threaded torque adjustment hub situated about the shaft, but within the air gap adjustment assembly and threadedly engaged with the air gap adjustment assembly;

(d) means for independently rotating the torque adjustment hub with respect to the air gap adjustment assembly without rotating the air gap adjustment assembly; and,

(e) means for rotating the air gap adjustment assembly and the torque adjustment hub as a single unit with respect to the assembly housing.

4,982,826

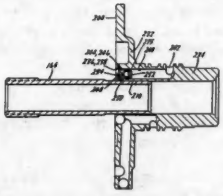
BLEEDER BALL CHECK VALVES IN AN AUTOMATIC TRANSMISSION

Gerald L. Holbrook, Rochester Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 188,602, Apr. 29, 1988, abandoned. This application Jan. 5, 1990, Ser. No. 463,871

Int. Cl.[5] F16D *25/063, 25/14*

U.S. Cl. 192—106 F **3 Claims**



1. In a vehicle transmission including a rotatable input member, an output member, a gear assembly for changing the ratio of torque between the input member and the output member, a plurality of friction elements for shifting between predetermined gears of the gear assembly, a rotatable fluid actuating device coupled to the input member and being movable axially

to engage at least one friction element, a check valve assembly comprising:

bleeder means for allowing fluid flow in a passageway to fill a fluid cavity between the fluid actuating device and an adjacent member to achieve centrifugal pressure balance on the fluid actuating device whenever the fluid actuating device is rotating, whereby fluid flow occurs when the fluid cavity is vented and fluid flow is blocked when the fluid cavity is pressurized, said bleeder means comprising a ball and a ball support disposed in the passageway and encompassing said ball to support said ball in the passageway.

said ball support having an aperture communicating axially therethrough for one-way fluid flow;

said aperture having a predetermined diameter to maintain a predetermined minimum pressure in the fluid cavity; and

said ball support including fingers at one end thereof to limit the travel of said ball within said ball support.

4,982,827

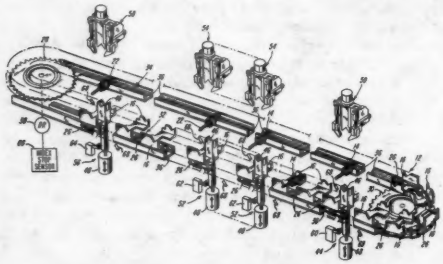
WORKPIECE PROCESSING SYSTEM

David R. Seitz, Vandalia; Hyman B. Finegold, Dayton, and Mark T. Heaton, Springfield, all of Ohio, assignors to Globe Products Inc., Dayton, Ohio

Continuation of Ser. No. 718,164, Apr. 1, 1985, abandoned. This application Jan. 30, 1989, Ser. No. 303,064

Int. Cl.[5] B65G *43/00*

U.S. Cl. 198—341 **20 Claims**



1. Workpiece processing apparatus for performing processing operations on workpieces comprising:

a plurality of processing machines, each respectively located at a processing station therefor;

an incoming load station;

an outgoing unload station;

an endless conveyor having plural carriers for carrying the workpieces along an endless path passing adjacent said incoming load station, said processing stations and said outgoing unload station;

plural machine load and unload transfer means, each located respectively adjacent each of said processing stations, for delivering workpieces from said carriers to receiving devices at said processing stations in preparation for having processing operations performed thereon and for returning workpieces after performance of the processing operations thereon to said carriers;

said incoming load station having conveyor incoming load transfer means for transferring workpieces prepared to have processing operations performed thereon to said carriers;

said outgoing unload station having conveyor outgoing unload transfer means for transferring workpieces upon which processing operations have been completed from said conveyor to said unload station;

carrier seat memory means for tracking each of said carriers and designating each of said carriers as either (a) a work-to-be-performed carrier or (b) a work-finished carrier;

means signaling said memory means to cause said memory means to designate each of said carriers as a work-to-be-performed carrier when it is filled at said incoming load station, said memory means retaining the work-to-be-performed designation of each of said carriers until it is emptied at a processing station;

means signaling said memory means to cause said memory means to designate each of said carriers as a work-finished carrier when it is emptied at a processing station, said memory means retaining the work-finished designation of each of said carriers until it is filled at said incoming load station with at least one workpiece upon which work is to be performed;

and incoming load logic means for controlling the operation of said incoming load transfer means to cause it to logically fill selected ones of said carriers with workpieces upon which work is to be performed so that the ratio between the number of those of said carriers being conveyed from said incoming load station to the first of said processing stations designated as work-to-be-performed carriers and the number of those of said carriers designated as work-finished carriers is finite and substantially constant.

4,982,828

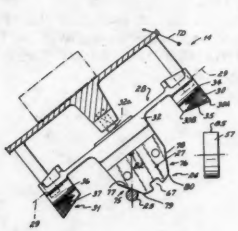
SORTATION CONVEYOR

Robert J. Nicolson, Shepardsville, Ky., and Anthony Jape, Doraville, Ga., assignors to Figgie International Inc., Richmond, Va.

Division of Ser. No. 116,019, Oct. 30, 1987, Pat. No. 4,856,642. This application Jun. 15, 1989, Ser. No. 366,428

Int. Cl.[5] B65G *47/94*

U.S. Cl. 198—365 **13 Claims**



1. Tilt tray sortation apparatus including a carriage, a tiltable tray pivotally mounted thereon, a latch pin mounted on one of the carriage and try, an index plate mounted on the other of said tray and carriage, said pin and index plate cooperating to hold said tray in a predetermined position, and means for unlatching said pin and plate to permit tipping of said tray to a tipped position at a sort location, the improvement comprising integral cam surface means on said index plate for engagement on said pin, and means for yieldably biasing said index plate in an operative direction with respect to said pin and said cam surface means against said latch pin, said cam surface means being defined as an integral portion of said index plate and having an inclined portion cooperating with said biasing means to resist return of said tray from a tipped position to a predetermined position.

4,982,829

FLEXIBLE ESCALATOR HANDRAIL

Gerald E. Johnson, Farmington, and Dat Nguyen, New Britain, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

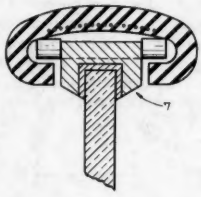
Filed Jan. 4, 1990, Ser. No. 460,800

Int. Cl.[5] B66B *23/24*

U.S. Cl. 198—337 **4 Claims**

1. A generally C-shaped escalator handrail made from an elastomeric material and operable to slide over a fixed guide rail, said handrail comprising a web portion overlying the

guide rail, said web portion having: an outer surface remote from the guide rail and formed with a medial elliptical part; an inner surface facing the guide rail and having a medial elliptical part; and a plurality of longitudinal reinforcing strands in said



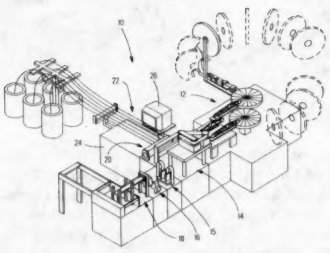
web portion between said inner and outer surfaces, said strands having their axes disposed along an imaginary transverse elliptical line with the outer and inner elliptical surface parts and the elliptical positioning of said reinforcing strand axes imparting increased lateral flexibility to the handrail.

4,982,830

PRODUCT FEEDING APPARATUS

Michael D. Strong, Mechanicsburg; Charles E. Zimmerman, Birdsboro, and Michael G. Kiapokas, Lancaster, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 18, 1989, Ser. No. 423,479
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—349.6 **7 Claims**



1. In an automated machine for making a plurality of different cable assemblies in a preselected order wherein at least two different connectors are utilized, a connector feeding apparatus for automatically selecting and feeding a series of said connectors in ordered relationship corresponding to said preselected order of said cable assemblies, said connector feeding apparatus comprising:

(a) a plurality of connector dispensing units in ordered, spaced relationship, one of said units having connectors contained therein of a first type and another of said units having connectors contained therein of a second type;

(b) conveyer means having a plurality of connector receiving units arranged for relative movement with respect to said dispensing units so that each connector receiving unit periodically dwells at a position of registration with each of said dispensing units;

(c) means for associating said ordered relationship of connectors with said plurality of connector receiving units so that each connector receiving unit that is to receive a connector is identified as to which of said connector types it is to receive; and

(d) means for selectively actuating each said dispensing means for moving a connector therefrom into a connector receiving means only when said connector receiving means is in said position of registration with said dispensing means and is identified to receive the type connector contained in said dispensing means,

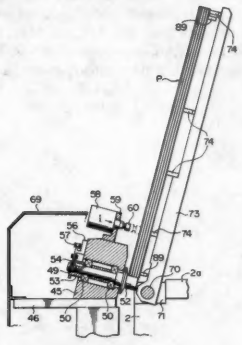
whereby said conveyer means will receive said series of connectors in said ordered relationship in adjacent receiving units.

4,982,831

PRINTED CIRCUIT BOARD ADAPTER SUPPLYING APPARATUS AND METHOD FOR USE IN PRINTED CIRCUIT BOARD DRILLING APPARATUS

Akira Irie, Aikawamachi; Yasuhiko Kanaya, Machida, and Tamio Ohtani, Hadano, all of Japan, assignors to Hitachi Seiko, Ltd., Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,285
Int. Cl.[5] B65G *47/00*
U.S. Cl. 198—617 **4 Claims**



3. A method for supplying at least one printed circuit board from one station to another station at high speeds, comprising the steps of:

conveying the at least one printed circuit board from the one station along a conveying path,

detecting the arrival of the at least one printed circuit board at a position just upstream of the another station; and

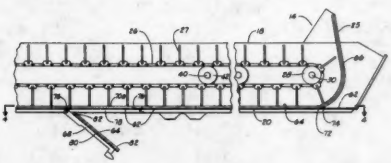
braking further conveying of the at least one printed circuit board in response to the detecting step just prior to the arrival of the board at the another station.

4,982,832

CERAMIC TILE CONVEYOR

David L. Garbelman, Edmond, and Raymond E. Montgomery, Oklahoma City, both of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Feb. 13, 1989, Ser. No. 309,118
Int. Cl.[5] B65G *19/18*
U.S. Cl. 198—735.3 **10 Claims**



1. A conveyor apparatus comprising:

a housing having an input end and an output end;

a conveyor means secured to the housing for conveying material from the input end of the housing to the output end;

a wear resistant material secured to portions of the housing along the path of the travel of the material comprising a plurality of tiles; and

means for preventing the conveyor means from contacting the wear resistant material.

4,982,833

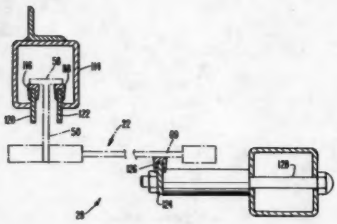
EXIT RAIL ASSEMBLY FOR HELICAL CONVEYOR BELTS

Michael R. Straight, Winchester, and Gerald C. Roinestad, Williamsburgh, both of Va., assignors to Ashworth Bros., Inc., Fall River, Mass.

Continuation of Ser. No. 406,108, Sep. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 224,696, Jul. 27, 1988, Pat. No. 4,940,133, which is a continuation-in-part of Ser. No. 171,390, Mar. 21, 1988, Pat. No. 4,867,301, which is a continuation-in-part of Ser. No. 83,272, Aug. 10, 1987, abandoned, said Ser. No. 224,696, is a continuation-in-part of Ser. No. 213,171, Jun. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 171,390, Mar. 21, 1988, Pat. No. 4,940,133, and a continuation-in-part of Ser. No. 83,272, Aug. 10, 1987, abandoned. This application Jun. 1, 1990, Ser. No. 532,120

Int. Cl.[5] B65G *21/18*

U.S. Cl. 198—778 **17 Claims**



1. A conveying system including a product conveyor belt adapted to be driven over an endless path having an upward helical portion and a return portion, said conveyor belt including rods and spacer plates having plate portions and upper belt support tabs at the top of said plate portions, and an exit means for guiding said conveyor belt off of said upward helical portion to said return portion, wherein the improvement comprises:

said exit means including a pair of rails engaging underneath said tabs to thereby lift said conveyor belt off of said upward helical portion.

4,982,834

GRIPPING MEANS

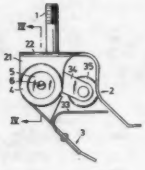
Kenneth Jacobsén, Eksjö , Sweden, assignor to Wamac AB, Sweden

Filed Jan. 27, 1989, Ser. No. 303,157

Claims priority, application Sweden, Jan. 28, 1988, 8800269

Int. Cl.[5] B65G *29/00*

U.S. Cl. 198—803.7 **4 Claims**



1. A gripping means comprising two jaws pivotable in relation to each other on a shaft, said shaft being secured to one of said jaws and extending through a sleeve secured to the other of said jaws, said shaft having an enlarged section adjacent to said sleeve and having substantially the same outer diameter as said sleeve and a helical spring, which externally bridges said sleeve and said enlarged section, the coils of said spring substantially abutting each other, wherein one end portion of said spring is freely movable on said enlarged section and the other end of said spring is connected to a roller which is turnably journalled and is arranged to be turned upon peripheral contact with a tread surface when said roller passes said tread surface.

4,982,835

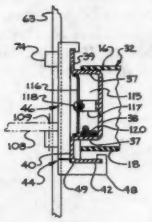
MODULAR CONVEYOR CONSTRUCTION AND MOUNTING BRACKETS THEREFOR

James R. Butler, Ingleside, and Roger L. Broederdorf, Crystal Lake, both of Ill., assignors to Intepro, Inc., Ingleside, Ill.

Filed Jan. 23, 1989, Ser. No. 300,027

Int. Cl.[5] B65G *15/00*

U.S. Cl. 198—836.3 **17 Claims**



1. For use with a conveyor system having a side frame member and a longitudinally movable carrier disposed adjacent thereto, said side frame member having a vertical component and a horizontal component, the vertical component having a relatively thin longitudinally extended end edge, comprising the combination of

bracket means for fixed attachment to the side frame member, at selective and arbitrary locations along the length thereof;

said bracket means having a horizontally disposed piece adapted to lie adjacent the horizontal component of the side frame member, and to project beyond the vertical component of the side frame member;

said bracket means also having a vertically disposed piece adapted to lie adjacent the vertical component of the side frame member, and to project beyond the said end edge of the vertical component of the side frame member;

said vertically disposed piece having a lateral end portion overlying the end edge of the side frame member and having means thereat suited to receive and trap the said end edge;

said vertically disposed piece extending to close proximity of the horizontally disposed piece;

means separably connecting the separate bracket means pieces together; and

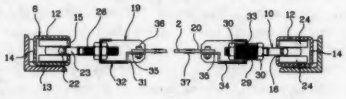
the vertically disposed piece being sized to provide that, when the separably connecting means is tight, the vertically disposed piece tightly entraps the said end edge of the conveyor side frame member, to frictionally secure the bracket means to the conveyor side frame member.

4,982,836

CONVEYOR BELT AND GUIDING SYSTEM THEREFOR

Roger L. Summers, Alliance, Ohio, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Jun. 14, 1989, Ser. No. 366,114
Int. Cl.[5] B65G *15/60*
U.S. Cl. 198—838 19 Claims



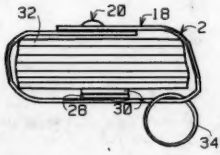
1. An improved conveyor including:
(a) an endless flexible conveyor belt extending between a head pulley and a tail pulley, one of which is power driven, for moving the conveyor belt in a linear longitudinal direction;
(b) a pair of parallel guide rails extending along opposite longitudinal edges of the conveyor belt;
(c) slide means supported by and moveable along the guide rails;
(d) transversely spaced pairs of bracket means for attaching the slide means to opposite edges of the conveyor belt for moving the slide means along the guide rails; and
(e) spring means mounted on only one of the bracket means of each pair of said bracket means for maintaining accurate tracking of the conveyor belt as the belt moves linearly longitudinally along and between the spaced rails.

4,982,837

KEY CADDY DEVICE

Hedvig Toth, 701 Royal Palm Place, Vero Beach, Fla. 32960

Filed Apr. 20, 1990, Ser. No. 512,187
Int. Cl.[5] A45C *11/18, 11/32*
U.S. Cl. 206—38.1 6 Claims



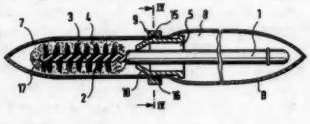
1. An improved key caddy device which comprises:
a substantially rectangular flexible strip of sheet material having an external surface and an internal surface, said strip being defined by first and second parallel longitudinal edges and first and second transverse edges of shorter length than said longitudinal edges,
a first fastener assembly comprising a first fastener element and a second fastener element, said first fastener element being fixed to said strip adjacent one of said transverse edges and said second fastener element being fixed to said strip adjacent the other of said transverse edges so that when said first and second elements are connected, said flexible strip forms a flexible case in which said first and second transverse edges overlap each other,
a second fastener assembly comprising a third fastener element and a fourth fastener element, said third fastener element being fixed to said internal surface of said strip,
a key ring carried on said strip adjacent one of said longitudinal edges thereof, and
a folded printed sheet, to which said fourth fastener element is fixed and releasably held thereby to said third fastener element, is enclosed within said flexible case whereby said folded sheet may be accessed by a user of said caddy device by opening said case and disconnecting said third and fourth fastener elements to permit said folded sheet and fourth fastener element to be removed from said caddy device.

4,982,838

DISPOSABLE MASCARA TESTER

Holger Fitjer, Ansbach, Fed. Rep. of Germany, assignor to Georg Karl geka-brush GmbH, Bechhofen-Waizendorf, Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,197
Int. Cl.[5] B65D *81/24*
U.S. Cl. 206—209 10 Claims



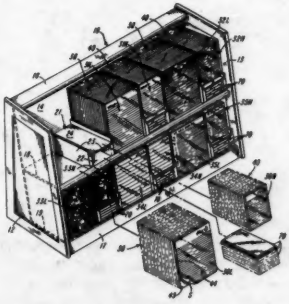
1. A disposable mascara tester for the hygienic testing of cosmetic materials comprising a stem mean, an applicattor attached to said stem means, a stripper means on said stem means operable to strip excess of said cosmetic materials from said applicator, a plastic covering disposed about said stem means, said stripper means and said applicator, said plastic covering being sealed to thereby define a sealed capsule in which said stem means, said stripper means and said applicator are encapsulated, and a sample of cosmetic material within said sealed capsule, said plastic covering having a reservoir chamber and a stem chamber, and clamping means clamping a portion of said plastic cover onto said stripper means, said clamped portion of said plastic cover dividing said plastic cover into said reservoir and said stem chambers, said applicator being operable to effect application of said sample of cosmetic material upon unsealing said plastic covering.

4,982,839

POINT-OF-PURCHASE STATIONERY

Mark T. Stevens, Centerville, Ohio, assignor to CSA Inc., Dayton, Ohio

Continuation of Ser. No. 354,445, May 19, 1989, Pat. No. 4,905,824, which is a continuation of Ser. No. 793,636, Oct. 31, 1985, Pat. No. 4,832,189, which is a continuation of Ser. No. 484,637, Apr. 13, 1983, abandoned. This application Feb. 28, 1990, Ser. No. 186,520
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—215 7 Claims



1. A point-of-purchase stationery system for use in a store

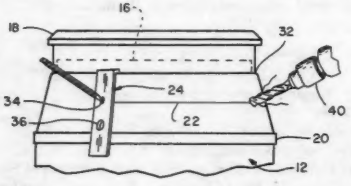
which sells articles to individuals associated with a college or other organization, said system comprising a plurality of letter-size pads of identical size, a plurality of note-size pads of identical size, said letter-size pads and said note-size pads including corresponding paper sheets bonded to corresponding stiff backing cards, each of said letter-size pads cooperating with one of said note-size pads to form a stationery set, said sheets of each said set of letter-size and note-size pads having custom printed thereon substantially identical multiple color artwork identifying the organization, said custom printed artwork on each said set of said pads having substantially the same color and appearance, each of said note-size pads being substantially smaller in size than the corresponding said letter-size pad, a portion of the artwork on each said note-size pad being smaller than the corresponding artwork on the corresponding said letter-size pad, said custom printed artwork on said sheets of each said set of pads being substantially different from said custom printed artwork on said sheets of each of the other said sets of pads to form a plurality of different said sets of pads, all of said sets of pads having artwork in the same colors, means for displaying said sets of pads to provide the individual with a selection from a variety of said custom printed stationery pads associated with the organization, and a film of transparent plastics material covering at least one of said pads and providing for viewing the corresponding said paper sheet.

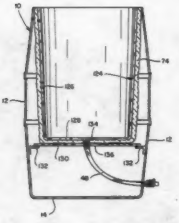
4,982,840

METHOD AND APPARATUS FOR CONVERTING BARREL TYPE UNITS INTO FREE STANDING MERCHANDISING DISPLAYS FOR HOLDING CHILLED PRODUCTS AND THE LIKE

Christopher C. Bidwell, Beverly Lake, Ga., and Dewalt W. Fowler, Manchester, Mo., assignors to Paul Flum Ideas, Inc., St. Louis, Mo.

Filed Nov. 8, 1989, Ser. No. 434,095
Int. Cl.[5] B65D *69/00*
U.S. Cl. 206—223 **14 Claims**





1. A kit for converting a storage barrel into a container for holding chilled products, said storage barrel including closed top and bottom end portions and a continuous side wall extending therebetween, said conversion kit comprising the components of

(a) a tub member adapted to hold ice and product positioned therein, said tube member having an upper end portion of a predetermined size and shape and including means for draining the same,

(c) means for supporting said tub member within said storage barrel after said barrel is severed at said predetermined severance location, said support means enabling the upper end portion of said tub member to lie substantially adjacent to the severed end portion of said storage barrel when positioned therewithin, and

(b) sizing means including means for determining the particular location on said barrel side wall at which to sever said barrel such that the upper end portion of said tub member will lie substantially adjacent to the severed end portion of said storage barrel when said tub member is positioned and supported therewithin,

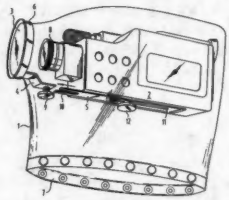
(d) drain tubing cooperatively engageable with the drain means associated with said tub member for emptying the accumulated waste water formed therein, said drain tubing providing means for conducting the accumulated waste water from said tub member to the exterior thereof, said kit components being grouped together and provided to a user for accomplishing said barrel conversion.

4,982,841

PROTECTIVE ENVELOPE FOR A CAMERA

Hans-Joachim Goedecke, Gabriel-von-Seidl-Strasse 29, 8022 Gruenwald, Fed. Rep. of Germany

Filed Jan. 29, 1990, Ser. No. 471,761
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 8900878[U]
Int. Cl.[5] B65D *85/38*
U.S. Cl. 206—316.2 **27 Claims**



1. A protective envelope for a camera, in particular a video camera, consisting of a waterproof material with a front window water-tightly integrated in the protective envelope material, characterized in that a supporting device (4) for fastening a spacing means (5) is arranged in the inside of the protective envelope (1), by which spacing means a maneuvering distance can be adjusted between the front window (3) and an autofocus system (8) of the camera (2), and that the protective envelope can be conformed to various housing shapes.

4,982,842

SAFETY NEEDLE CONTAINER

William H. Hollister, Keene, N.H., assignor to Concord/Portex, Keene, N.H.

Filed Jun. 4, 1990, Ser. No. 532,558
Int. Cl.[5] A61M *5/32, 5/00*
U.S. Cl. 206—365 **27 Claims**

1. A safety device to be used with a needle having a hub, comprising:

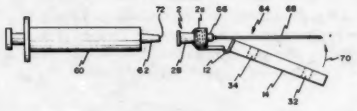
a base having

a first section including a protrusion and securing means surrounding said protrusion for effecting mating of said protrusion to said hub of said needle;

a second section integrated to said first section extending away from said securing means and having means for mating with an ejection end of a syringe; and

a housing flexibly connected to said base and pivotable

toward a position in substantial alignment along the longitudinal axis of said needle for enveloping said needle, said



housing further having integral locking means for fixedly retaining said needle within said housing once said housing has been pivoted to said position.

4,982,843

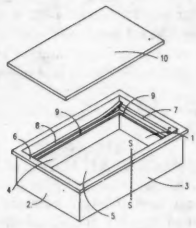
SHARPS DISPOSAL UNIT

Hedwig E. Jones, 3519 Gemini Ct., Concord, Calif. 94519

Filed Mar. 2, 1990, Ser. No. 491,200

Int. Cl.[5] B65B *43/20, 85/24*

U.S. Cl. 206—366 **2 Claims**



1. A sharps disposal unit comprising:

(a) a box made of rigid plastic, having a bottom, a front, a back and two sides, defining an open top;

(b) an unattached, flat lid of a firm, but flexible plastic, of a shape to complement the open top;

(c) a slot in the front of the box, across it's width and close to it's upper edge, to receive the lid and showing a downward slope to facilitate the sliding in of the lid;

(d) tracks along the inner aspect of the sides and back of the box, close to the top, composed of an upper rim and a lower rim, with a space in between for the lid to slide in, the upper rim running parallel to the lower rim along the back of the box, continuing parallel on both sides along the sides of the box until it approaches the front, when the upper rim curves upwards and away from the lower rim to meet either end of the upper edge of the slot in the front of the box and the lower rim running parallel to the upper rim along the back and most of the sides of the box, but continues in a straight line when the upper rim begins to curve upwards, then continues in a straight line along the inner front of the box, forming a step below the slot.

4,982,844

BAKERY BASKET

Michael K. Madan, Berkeley Heights; Vinod Malhotra, Piscataway, both of N.J., and William Loh, Dalton, Mass., assignors to MP Acquisition Corp., Cranford, N.J.

Filed Jun. 29, 1990, Ser. No. 545,866

Int. Cl.[5] B65D *21/06*

U.S. Cl. 206—506 **23 Claims**

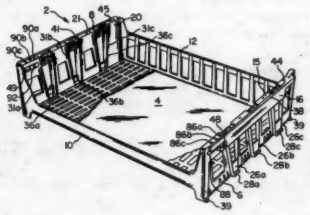
1. A bakery basket comprising:

(a) a bottom, opposed side walls and a back wall joined together to form an upwardly open basket body;

(b) a plurality of vertical support towers in each side wall, with each support tower formed of an outwardly directed projection which defines a hollow opening directed toward an interior of said basket, with said hollow openings configured to receive the support towers of another bakery basket when nested together;

(c) a horizontal support ledge within each side wall at an upper portion thereof; and

(d) a slidable bail positioned within each of said side walls and on said support ledge, with each slidable bail including contiguous upper support lugs, lower support lugs and open areas adjacent each hollow opening in said side walls, with the slidable bails moveable from a first posi-



tion, with the upper support lugs of the bails aligned with said hollow openings and receiving the support towers of another bakery basket to provide stacking at a first height, to a second position with the lower support lugs of the bails aligned with said hollow openings and contacting the support towers of another bakery basket to provide stacking at a second, lower height, and to a third position with the open areas of the bails aligned with said hollow openings and permitting nesting with another bakery basket.

4,982,845

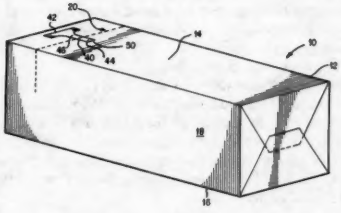
RESEALABLE ENCLOSURE

Brian Prascak, Stamford, and Todd Erickson, Danbury, both of Conn., assignors to James River Corporation, Richmond, Va.

Filed Jun. 19, 1989, Ser. No. 367,568

Int. Cl.[5] B65D *81/24, 45/00*

U.S. Cl. 206—621 **10 Claims**



1. A resealable enclosure for holding and protecting dispensable products, comprising:

a cover having a top panel, said top panel having side edges and a central portion intermediate said side edges;

means defining a tear path in said top panel, said tear path having a width which extends across said central portion of said top panel to form an aperture through which products may be extracted from the enclosure, said defining means having a weaker portion where said tear path intersects said central portion of said top panel and stronger portions on either side of said weaker portion proximate said side edges, said stronger portions being more resistant than said weaker portion to forces tending to separate said to panel along said tear path; and

a closure tab having a first end permanently secured to said top panel on one side of said tear path, and a second end

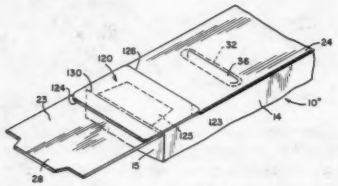
having an adhesive coating facilitating releasable attachment of said second end facilitating releasable attachment of said second end to said top panel on the opposite side of said tear path to close said aperture, said second end of said closure tab having a width substantially less than the width of said tear path, such that said second end attaches to said top panel in a region of said weaker portion of said defining means.

4,982,846

SIFT-PROOF CARTON AND BLANK THEREFOR

Herbert Friedman, Fort Lee, N.J., assignor to Ivy Hill Corporation, New York, N.Y.

Division of Ser. No. 344,972, Apr. 27, 1989, Pat. No. 4,941,575.
This application Feb. 16, 1990, Ser. No. 482,078
Int. Cl.[5] B65D 5/70
U.S. Cl. 206—621.3 39 Claims



1. In a carton comprising

(A) sides and ends defining a rectangular parallelepiped, said sides being formed by side panels and said ends by end panels, one of the carton ends comprising first, second, and third end panels which are connected to first, second and third side panels, respectively;

(i) said first and third end panels extending from said first and third side panels, respectively, a substantial distance towards said third and first side panels, respectively, in an at least partially overlying relationship,

(ii) said second end panel being pivotably connected to said second side panel and extending partially over said first and third end panels; and

(B) means adhering said second end panel to the outer of said first and third end panels which permits said second end panel to be separated from said outer end panel and pivoted to expose the previously underlying portion of said outer end panel;

the improvement comprising

at least one of said first and third end panels having a length in excess of the side panel from which it extends, with said excess length being at least partially compacted and folded against said outer end panel by said second end panel when said second end panel extends partially over said first and third end panels, thereby providing a sift-resistant carton.

4,982,847

PRINTED WIRING BOARD STAND-OFF GUIDE

Alfred H. Glover, Decatur; Joseph T. Betterton, Arab, and Bruce Hepler, Huntsville, all of Ala., assignors to Acustar, Inc., Troy, Mich.

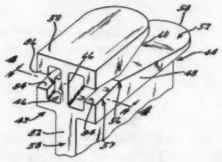
Filed Nov. 13, 1989, Ser. No. 434,736
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—41 10 Claims

1. A board guide assembly for receiving a board and aligning the board having a first side along a horizontal plane and a vertical plane, said assembly comprising;

guide means (42) for supporting said first side (20) in a predetermined position;

said guide means (42) including vertical positioning means (44) for receiving and guiding the board (12) to a predetermined vertical position, horizontal positioning means (46) for receiving and guiding the board (12) to a predetermined horizontal position; said vertical positioning means (44) including a lower guide member (48) and an upper guide member (50) for receiving the board (12) therebetween at said predetermined vertical position:

said lower guide member (48) including an apron (52) having an upper guide surface upwardly ramped to a clamp point (56) to guide said board means (12) to said predetermined



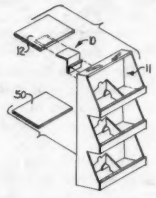
vertical level; said upper guide member (50) including an extension portion (60) extending partially over said apron (52) and having a downwardly ramping lower surface extending over said apron (52) from said clamp point (56) for guiding said board means (12) between said apron (52) and said extension portion (60) and for clamping the board (12) at said clamp point (56) at said predetermined vertical level.

4,982,848

DISPLAY RACK WITH HANGER FIXTURE

David F. Church, Kernersville; Michael B. Urbowicz, and Joseph W. Honeycut, both of Winston-Salem, all of N.C., assignors to Chesapeake Display and Packaging, Winston-Salem, N.C.

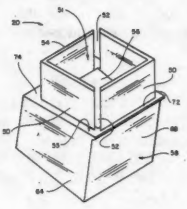
Filed Oct. 31, 1988, Ser. No. 264,623
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—55 20 Claims



1. In combination, a display rack formed of paperboard and including a substantially upright rear wall having at least one relatively narrow horizontal slot formed therein, and a hanger fixture for supporting the display rack, said hanger fixture being integrally formed and comprising on L-shaped bracket having substantially horizontal and substantially vertical walls, said horizontal and vertical walls being substantially rectangularly shaped and formed of relatively thin material, a retainer wall formed of relatively thin material and connected to and being integral with the lowermost portion of said vertical wall and extending upwardly therefrom in substantially parallel spaced relation to said vertical wall to define a gap between said vertical wall and said retainer wall, a lip connected to an upper portion of said retainer wall and extending outwardly a relatively short distance from said retainer wall in a direction away from said vertical wall of said bracket, said lip being dimensioned to be readily received and passed through said slot of said rear wall of said display rack, said retainer wall being received through said slot and such that a portion of said rear wall of said display rack is received within said gap to thus interconnect the rack and the hanger fixture, and pressure sensitive adhesive means on the under side of said horizontal

wall of said bracket for adhesively securing the same to a supporting surface.

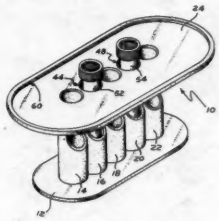
4,982,849
ADAPTER MEANS FOR CONVERTING A HORIZONTALLY ARRANGED SHELF MEMBER IN A MODULAR DISPLAY UNIT TO AN ANGULAR ORIENTATION
Paul L. Flum, Ladue, and Dewalt W. Fowler, Manchester, both of Mo., assignors to Paul Flum Ideas, Inc., St. Louis, Mo.
Filed Mar. 5, 1990, Ser. No. 489,027
Int. Cl.[5] A47B *47/00, 57/04*
U.S. Cl. 211—59.2 **7 Claims**



6. In a modular display unit having a plurality of horizontally arranged shelf members vertically assembled in spaced apart relationship one above the other, a plurality of elongated support members connecting vertically spaced pairs of said shelf members, each shelf member having upper and lower engagement means associated therewith for cooperatively engaging the opposed end portions of said support members, the improvement comprising an adapter member for converting said shelf members from a horizontal orientation to an angularly related orientation, said adapter member having opposed end portions, first means associated with one end portion of said adapter member for cooperatively engaging the upper and lower engagement means associated with each of said shelf members, second means associated with the opposite end portion of said adapter member for cooperatively engaging the opposed end portions of said support members, said first cooperatively engageable adapter means being angularly related and laterally offset relative to said second cooperatively engageable adapter means such that when a plurality of said adapter members are operatively positioned and engaged with the respective upper and lower engagement means associated with at least one horizontally disposed shelf member and a plurality of support members are engaged with said operatively connected adapter members said at least one shelf member will be repositioned to an angular orientation relative to the horizontal and the respective support members located above and below said at least one shelf member will be maintained in corresponding vertical alignment with each other, the adapter members engaged with said upper shelf engagement means being positioned and engaged therewith in a different orientation as compared to the adapter members positioned and engaged with said lower shelf engagement means.

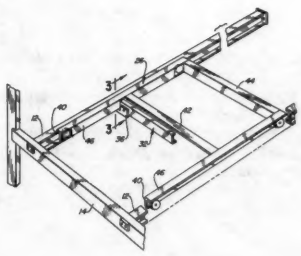
4,982,850
TEST-TUBE HOLDER WITH SAFETY SHIELD
Donald B. Mears, 31 Locke Dr., Enfield, Conn. 06082
Filed Jun. 28, 1989, Ser. No. 372,320
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—74 **7 Claims**

1. A hand-held test-tube holder comprising:
a. a horizontal base;
b. a row of tubular shafts that are integral with the base and which extend vertically therefrom, wherein the shafts are each adapted in size and shape to house a test tube; and
c. an overlying horizontal top that is integral with the shafts wider than a user's cupped hand which grasps the shafts to lift the holder, whereby the top acts as a shield to prevent that hand from being accidentally nicked by a needle



when a sample is attempted to be drawn from the test tube, or deposited therein.

4,982,851
SUPPORTED PALLET RACK
Anthony N. Konstant, 920 Fisher La., Winnetka, Ill. 60093
Filed Feb. 7, 1990, Ser. No. 476,742
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—151 **7 Claims**



1. In a pallet rack which comprises at least one pair of spaced, parallel rails, and at least one wheeled cart mounted in rolling relation with said pair of rails and defining a load-carrying area, the improvement comprising, in combination:
said rails and cart each defining a front end; cross brace means extending between said rails and positioned to support the bottom of a pallet placed on said rails adjacent said front end, said cross brace means defining a space adjacent each of said rails to permit the front end of said cart to roll toward the front end of said rails between the cross brace means and each rail; said cart comprising a pair of wheel-carrying side members positioned parallel to said rails and transverse support member means connecting said side members, said transverse support member means being spaced from the cart front end by a distance sufficient to allow said front end of the cart to roll between the cross brace means and each rail.

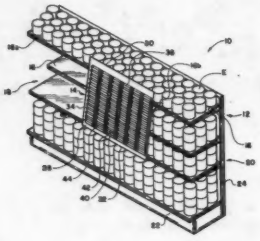
4,982,852
DISPLAY ASSEMBLY
Norman A. Johansen, North Ridgeville, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio
Filed Dec. 29, 1988, Ser. No. 291,818
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—162 **13 Claims**

1. A display assembly for sample materials, merchandise or the like, said display assembly comprising,

a shelf sub-assembly having a plurality of shelves defining a work space and a display space,

a panel movably supported directly on said shelf sub-assembly and having compartments therein for displaying sample materials, merchandise or the like, and

means for movably supporting the panel directly on said



shelf sub-assembly, said means comprising a rail secured to one of said shelf sub-assembly or panel, and a cooperating first roller means secured to the other of said shelf sub-assembly or panel for movable engagement along said rail, whereby said panel may slide relative to said shelf sub-assembly, to selectively cover or open the work space of said shelf sub-assembly.

4,982,853

REINFORCEMENT MECHANISM FOR MULTI-STAGE TELESCOPIC BOOM

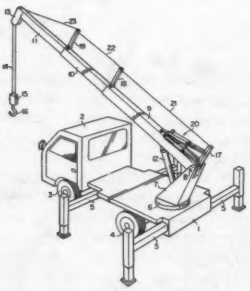
Mitsuhiro Kishi, Ashikaga, Japan, assignor to Hikoma Seisakusho Co., Ltd., Japan

Filed Apr. 7, 1989, Ser. No. 335,201

Claims priority, application Japan, Feb. 9, 1989, 64-32401; Feb. 9, 1989, 64-32402

Int. Cl.[5] B66C *23/42*

U.S. Cl. 212—231 **5 Claims**



1. In a multi-stage boom having a plurality of boom members including a first boom member, at least one intermediate boom member and a last boom member, each boom member being slideably inserted into its subordinate boom member to undergo telescopic expansion and contraction, the improvement comprising: an operating shaft connected pivotably at its bottom portion erectly to a peripheral lower end portion of the last boom member; a plurality of adjusting shafts, each adjusting shaft being disposed pivotably at its bottom portion erectly to a peripheral upper end portion of respective ones of the boom members except the first boom member; a first tension cable connected at its one end to a lower end portion of the first boom member, lead thereform through an upper end opening of a subordinate boom member, turned forwardly at a top portion of the adjusting shaft disposed at a peripheral upper end portion of the subordinate boom member, and connected at its other end to an upper end portion of the first boom member; at least one intermediate tension cable connected at its one end to a lower end portion of a corresponding intermediate boom member, lead therefrom through an upper end opening of a subordinate boom member, turned forwardly at a top portion of the adjusting shaft disposed on a peripheral upper end portion of the subordinate boom member, and connected at its other end to a top portion of another adjusting shaft disposed on a peripheral upper end portion of the corresponding intermediate boom member; a last tension cable connected between a top portion of the operating shaft and a top portion of the adjusting shaft disposed on a peripheral upper end portion of the last boom member; and means for controlling a tilting angle of the operating shaft according to the expansion amount of the multi-state boom to tension a chain of the first, intermediate and last tension cables.

4,982,854

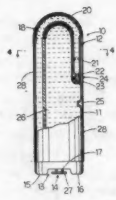
BEVERAGE CONTAINER WITH SIPPING TUBE

Tuyoshi Ichimiya, Hagi, Japan, assignor to Kabushikikaisha Matumotoya Shokuhin, Hagi, Japan

Filed Jul. 18, 1989, Ser. No. 381,235

Int. Cl.[5] B65D *1/06, 23/08, 25/46*

U.S. Cl. 215—1 A **3 Claims**



1. A beverage container comprising:

a hollow cylindrical body formed of a synthetic resin material and having a top and a bottom;

supporting surfaces forming a concave section at the center of said bottom;

a longitudinal groove extending from a side surface of said cylindrical body across said top of said cylindrical body;

a beverage inlet disposed inwardly of said supporting surfaces at said concave section formed at the center of said bottom;

a flange formed at the edge of said beverage inlet;

a cover sealing said beverage inlet; and

a sipping tube of a size to fit within said groove, said sipping tube having a bottom end open to an interior of said hollow cylindrical body adjacent said bottom, a top portion extending beyond the top of said cylindrical body, a constriction at said top portion of said sipping tube, and a bellows in said sipping tube between said bottom end and said top portion, said sipping tube being folded about said bellows and fitted into said longitudinal groove.

4,982,855

SCREW CLOSURE FOR A BOTTLE

Michael Hertrampf, Schafereiweg 7, D-3007 Gehrden 1, Fed. Rep. of Germany

PCT No. PCT/EP88/00026, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/06129, PCT Pub. Date Aug. 25, 1988

PCT Filed Jan. 15, 1988, Ser. No. 272,695

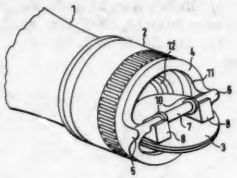
Int. Cl.[5] B65D *47/20*

U.S. Cl. 215—235 **17 Claims**

1. A cylindrical screw-on closure cap for a container having

an externally-threaded neck and an internal seat in the top of said neck,

a separate unitary sealing member, rotatably connected to the top of the cylindrical part of said cap, having an annular sealing surface which fits onto said seat and seals said



container when said cap is screwed tightly onto said neck in closed position,

said sealing member being rotatably mounted on an axis located in a plane perpendicular to the axis of said neck,

whereby said sealing member can tilt about said rotational axis when said closure cap is loosened to open position.

4,982,856

HIGH TEMPERATURE, HIGH PRESSURE CONTINUOUS RANDOM GLASS FIBER REINFORCED THERMOPLASTIC FLUID VESSEL AND METHOD OF MAKING

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1989, Ser. No. 370,678
Int. Cl.[5] B65D *1/16*
U.S. Cl. 220—3 **19 Claims**

1. A high pressure, high temperature fluid vessel comprising:

a plurality of sheets of thermoplastic members shaped to form a hollow fluid vessel, each member comprising a thermoplastic resin impregnated continuous filament randomly oriented glass fiber mat, said members being secured together at at least one joint; and

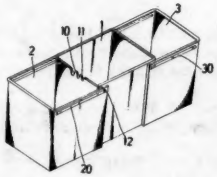
means for sealing said at least one joint.

4,982,857

EXPANSIBLE GARBAGE CAN FOR CLASSIFICATION OF GARBAGES

Cheng-Hsien Sher, No. 18, Lane 195, Nan Tai Rd., Kauhsiung City, Taiwan

Filed Apr. 30, 1990, Ser. No. 516,947
Int. Cl.[5] B65D *9/00*
U.S. Cl. 220—8 **4 Claims**



1. An expansible garbage can, comprising:

a main case having two elongated raised portions bilaterally vertically on the two opposite edges of its front side with a front pair of bolts bilaterally extending outward from the top ends of said two elongated raised portions, and a rear pair of bolts bilaterally extending outward from the two opposite edges of its back side;

a front side frame movable connected to said main case at the front side and having two opposite, elongated grooves on its two opposite side walls for the sliding therein of the front pair of bolts of said main case; and

a rear side frame movably connected to said main case at the back side and having two opposite elongated grooves on its two opposite side walls for the sliding therein of the rear pair of bolts of said main case;

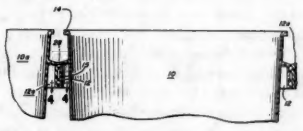
characterized in that the garbage can can be flexibly arranged either in a single-bin status with said rear side frame and said main case received inside said front side frame or in a double-bin status with said main case received inside the rear side frame, or in a triple-bin status with said main case, said rear side frame and said front side frame in an extended condition.

4,982,858

CONTAINER CONNECTOR SYSTEM

John W. von Holdt, 6864 Lexington La., Niles, Ill. 60648

Continuation-in-part of Ser. No. 831,527, Feb. 21, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 62,452
Int. Cl.[5] B65D *21/02*
U.S. Cl. 250—23.4 **20 Claims**



1. In a container, the improvement comprising, in combination:

a circumferentially extending continuous array of longitudinally extending teeth which are spaced from each other by recesses of a shape proportioned to receive identically-shaped teeth of an adjacent container of similar shape, said recesses each defining a radially recessed bottom surface and said teeth each defining a radially projecting top surface; said container also defining a circumferential flange substantially continuously extending across one end of each of said teeth, said flange defining a circumferentially extending surface which occupies a radial level which is between the radial levels of the bottom surfaces and the top surfaces, whereby the interengaging teeth of said container and another, identical container cannot move longitudinally.

4,982,859

BASE FRAME STRUCTURE FOR CONTAINERS OR LOAD CARRYING PLATFORMS

David Colebrook, 19 Tangier Road, Guildford, Surrey, England, assignor to David Colebrook, Guildford, England

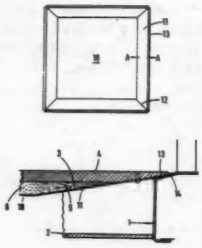
PCT No. PCT/GB87/00562, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/00912, PCT Pub. Date Feb. 11, 1988

PCT Filed Aug. 7, 1987, Ser. No. 303,663

Claims priority, application United Kingdom, Aug. 8, 1986, 8619400

Int. Cl.[5] B65D *90/02*

U.S. Cl. 108—51.1 7 Claims



1. A flooring element for a container or load carrying platform characterised by an underpan curved in at least two directions, flooring means mounted on and fixed relative to the underpan with space defined therebetween, and polyurethane foam mixture having a density of at least 60 kg/m^3 located in and filling the said space between the flooring means and underpan, the flooring element being locatable on and attachable to the longitudinal and transverse beams of a base frame of the container.

4. A base frame structure for containers or load carrying platforms comprising a longitudinal frame structure having longitudinal side beams with transverse beams extending therebetween and a dished sheet underpan supported on the longitudinal and transverse beams of the base frame structure, a flooring of sheet material and a load distributing rigid filling material located in the space between the underpan and the under surface of the flooring material, characterised in that the sheet underpan is curved in at least two directions, that the flooring of sheet material is supported on the underpan, and that the load distributing rigid filling material is a polyurethane foam mixture, having a density of at least 60 kg/m^3.

5. A base frame structure for containers or load carrying platforms comprising a longitudinal frame structure having longitudinal side beams with transverse beams extending therebetween and a dished sheet under pan supported on the longitudinal and transverse beams of the base frame structure, a flooring of sheet material and a load distributing rigid filling material located in the space between the underpan and the under surface of the flooring material, characterised in that the sheet underpan is curved in at least two directions and that the flooring of sheet material is supported on the underpan, the underpan is a single sheet of metal of rectangular configuration and has edge portions of the sheet bent upwardly, opposite ends of each edge portion engaging respective ends of the next adjacent edge portions, and in that a flange extends outwardly from the extreme outer edge of each edge portion for connecting the underpan to transverse and longitudinal beams of the base frame structure, at least one pair of opposed flanges being arranged to rest on sloped portions of either the longitudinal or transverse beams.

4,982,860

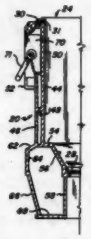
EXTRUSION FOR CONTAINER WITH INTEGRAL PALLET

John C. Dinsmoor, Denver, and Barry Van Everen, Ft. Collins, both of Colo., assignors to Stanley Aviation Corporation, Aurora, Colo.

Division of Ser. No. 340,795, Apr. 20, 1989, Pat. No. 4,936,476. This application May 14, 1990, Ser. No. 525,336

Int. Cl.[5] B65D *8/06, 19/04*

U.S. Cl. 220—606 3 Claims



1. An extrusion for forming an integral pallet and container, said extrusion comprising:

a sidewall having an inner panel and an outer panel spaced from said inner panel with an air space therebetween;

a bumper panel above said sidewall having an inner surface lying in the same plane as said inner panel of said sidewall and having an outer surface spaced outwardly of but parallel to said outer panel of said sidewall to form a first bumper edge; and

a pallet structure formed below but integral with said sidewall and having an inner surface having an inner first portion extending downwardly and inwardly from said inner panel of said sidewall to a depending edge, an inner second portion extending downwardly from the depending edge of said inner first portion parallel to but inwardly of said inner panel and terminating in a bottom edge, an outer first portion extending downwardly and outwardly from said outer panel of said sidewall to a depending edge, an outer second portion extending downwardly the depending edge of said outer first portion and lying in the same plane as said outer surface of said bumper panel to form a second bumper edge and terminating in a depending edge, an outer third portion extending downwardly and inwardly from the depending edge of said outer second portion and terminating in a bottom edge, and a bottom, generally horizontal portion interconnecting the bottom edge of said outer third portion and the bottom edge of said inner second portion to form a support base for said pallet structure.

4,982,861

EXPLOSION-SAFE LIQUID CONTAINER

Johannes J. de Groot, Gorssel, and Paul J. Sikkens, Zoetermeer, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Sep. 19, 1988, Ser. No. 246,227

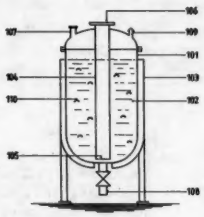
Claims priority, application European Pat. Off., Sep. 21, 1987, 87201802

Int. Cl.[5] B65D *25/00*

U.S. Cl. 220—89.1 11 Claims

1. A container adapted for holding liquid compounds liable to exothermic decomposition, said container being provided with at least one explosion proof liquid release system comprising a conduit having an inlet and an outlet and a rupture disk

positioned in said conduit, said liquid release system being operated by a pressure lower than the maximum pressure



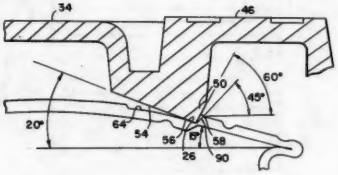
rating of said container, and said inlet of said conduit being positioned at the bottom of said container.

4,982,862

DIGITALLY OPENABLE, RESEALABLE CONTAINER CLOSURE

Robert L. La Barge, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 14, 1989, Ser. No. 338,310
Int. Cl.[5] B65D *17/44*
U.S. Cl. 220—278 **20 Claims**



1. In a sheet metal end closure assembly for a container that includes

a generally planar wall portion having a peripheral chime for securement to a container body,

a score line perimetrically defining an inwardly displaceable opening panel for forming an opening to permit dispensing of the container contents therethrough,

a continuous lip having a substantially smooth sealing surface thereon surrounding said score line defined opening panel,

a sealing cap having a perimetric surface contoured for a gas tight interfacial sealing relationship with said continuous lip and displaceable intermediate a first location remote from said score line defined opening panel to a second location disposed in generally overlying relation with said continuous lip,

the improvement comprising

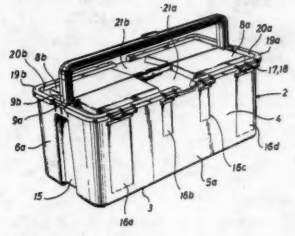
the opening panel and the surrounding contiguous surface of said continuous lip being of upwardly domed configuration and selectively contoured to position the undersurface of the portion of said continuous lip disposed closely adjacent to said score line substantially coplanar with the upper surface of said opening panel disposed closely adjacent to said score line to form an upwardly directed inwardly facing perimetric abutment adjacent to said score line for insuring selective exposure of said score line to substantially pure fracture inducing shear stresses in response to a downwardly directed opening force applied to said opening panel closely adjacent to said score line.

4,982,863

PORTABLE BOX

Hans Skillius, Halmstad, Sweden, assignor to A/S E. Danberg Group, Nykobing F, Denmark

Filed Mar. 20, 1990, Ser. No. 496,978
Claims priority, application Denmark, Mar. 22, 1989, 337/1989; Fed. Rep. of Germany, Sep. 21, 1989, 8911266[U]
Int. Cl.[5] A65D *25/28*
U.S. Cl. 220—318 **6 Claims**



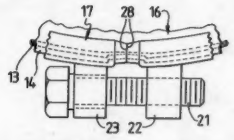
1. A portable box comprising a box body including a bottom, a circumferential wall defining at its upper rim an opening, a cover closing the opening as well as a handle means in form of a preferably hoop-shaped handle pivotally hinged relative to the box body and the cover, a locking device being provided in the hinged area of said handle, where said locking device allows an opening or closing of the cover of the box body in a first portion of the turning movement of the handle and in other portions of said turning movement prevents an opening of the cover, wherein the handle (*9a, 9b*) is pivotally hinged to the cover (*8a, 8b*), and wherein the locking device comprises two aligned locking protrusions (*11a*) projecting from their respective opposing wall portion and two aligned locking means (**23**) associated with the handle (*9a, 9b*) and situated at their respective end of the cover, said two locking means comprising a hollow interior receiving the corresponding locking protrusion (*11a*) and further comprising a radial slot (**24**) allowing an insertion of the locking protrusion (*11a*) into said locking means (**23**) when the handle (*9a, 9b*) is situated in said first portion of its turning movement.

4,982,864

SEAL RING FOR OPEN HEAD DRUM

Fred A. Kusta, Birmingham, Ala., assignor to Self Manufacturing Company, Birmingham, Ala.

Filed Feb. 6, 1990, Ser. No. 475,746
Int. Cl.[5] B65D *45/32*
U.S. Cl. 220—320 **13 Claims**



1. An improved ring for securing and sealing a lid to an open head drum, said open head drum having an outwardly extending upper edge and said lid having an annular seat formed thereon for engagement on said upper edge, said annular seat holding a compressible gasket in position on said upper edge to form a seal, said improved ring comprising, a circular member split on one radian thereof to form a pair of adjacent ends, said circular member having a concave inner surface for encasing

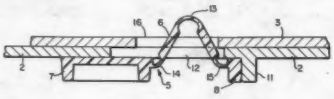
the outer peripheral portion of said lid and said upper edge of said open head drum and means for urging said adjacent ends toward each other, each end of said pair of adjacent ends having a radially projecting reduced diameter portion.

4,982,865

WALL COUPLING WITH FLEXIBLE RETAINING STRIP

David A. Williams, Hartford, Great Britain, assignor to Lin Pac Mouldings Limited, Birmingham, United Kingdom

Filed Sep. 6, 1989, Ser. No. 403,611
Int. Cl.[5] B65D *45/20*
U.S. Cl. 220—324 19 Claims



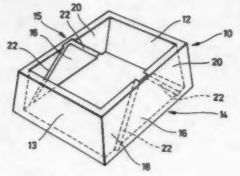
1. A wall coupling comprising a first wall part having a first opening and which is to be positioned adjacent to a second wall part having a second opening with the first and second openings coinciding; a retaining strip carried by the first wall part on the side thereof which is, or is to be, remote from the second wall part, said retaining strip overlying the first opening and having opposite end regions mounted to be displaceable relatively towards and away from each other and a mid-length region which is foldable and unfoldable respectively in response to said relative displacement between the end regions whereby, during displacement of the end regions relatively towards each other on the first wall part, the mid-length region is folded to, or towards, a doubled condition in which it extends through the first opening for entering the second opening to couple the two wall parts and restrain them from displacement over each other wherein at least one end region of said retaining strip is displaceable along track means on the first wall part.

4,982,866

A BI-STABLE HINGE UNIT OF ELASTIC MATERIAL

Louis A. Krawagna, Toronto, Canada, assignor to Firma Creanova AG, Zurich, Switzerland

Filed Feb. 23, 1989, Ser. No. 315,415
Claims priority, application United Kingdom, Mar. 7, 1988, 8805380
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—335 18 Claims



1. A bi-stable hinge unit (10) of elastic material connected two substantially inflexible end portions (12, 13) to take up two stable positions on either side of an intermediate unstable position, characterized in that

said hinge unit (10) comprises two equal elements (14, 15), each of which having two cantilever arms (18, 20) linked to each other by two folding lines (22) and a substantially triangular substantially rigid plate (16) arranged between and defined by said folding lines (22), and that

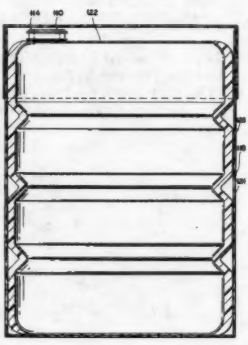
said elements (14, 15) are arranged substantially parallel to each other with a distance therebetween and forming the main hinge line between said end portions (12, 13), by folding along said main hinge line the four cantilever arms (18, 20) will start to deflect and act as springs and the two triangular plates (16) will rotate through approximately 180° in a plane normal to the elements (14, 15).

4,982,867

DRUM WITH SELF-SUPPORTING LINER

Robert A. Dubois, Marion, Ohio, and Richard A. Caron, Long Meadow, Mass., assignors to Greif Brothers Corporation, Delaware, Ohio

Continuation-in-part of Ser. No. 458,249, Dec. 28, 1989, which is a continuation-in-part of Ser. No. 304,965, Jan. 30, 1989, abandoned. This application Mar. 2, 1990, Ser. No. 487,529
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—403 15 Claims



1. A drum for holding materials comprising: a blow-molded self supporting liner having liner sidewalls with a plurality of circumferential continuous groove means formed on said sidewalls for reinforcing said liner; and

shell means surrounding said liner around a common longitudinal axis, said shell means having shell sidewalls, said liner sidewalls and shell sidewalls being curved around axes parallel to said longitudinal axis, and having relatively large sidewall radii of curvature in relation to a cross-sectional dimension of said shell.

4,982,868

BAIL TYPE PITCHER FOR THIN WALLED CONTAINER

Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35630

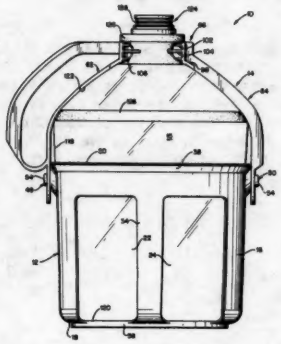
Continuation-in-part of Ser. No. 432,672, Nov. 7, 1989. This application May 30, 1990, Ser. No. 530,418
Int. Cl.[5] B65D *23/10*
U.S. Cl. 220—404 30 Claims

1. A container carrier assembly comprising:

(a) a lower carrier portion including a peripheral sidewall, a bottom wall, and an upper peripheral edge; and

(b) a pivotable upper carrier portion including a pair of strap portions detachably secured at first ends to said lower

container carrier portion at diametrically opposed locations and terminating at a container neck engaging portion



integrally formed between second ends of said strap portions.

4,982,869

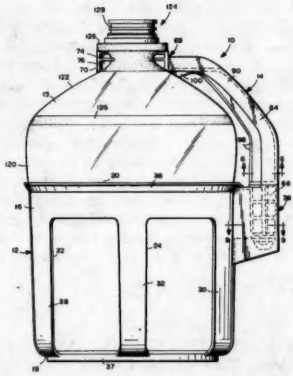
PIVOTING HANDLE TYPE PITCHER FOR THIN WALLED CONTAINER

Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35630

Continuation-in-part of Ser. No. 432,672, Nov. 7, 1989. This application May 30, 1990, Ser. No. 530,417

Int. Cl.[5] B65D *23/10*

U.S. Cl. 220—404 **40 Claims**



1. A container carrier assembly comprising:

(a) a lower carrier portion including a peripheral sidewall, a bottom wall, and an upper peripheral edge;

(b) an upper carrier portion including a relatively rigid handle portion pivotally mounted at one end to said lower carrier portion, and provided with a container neck engaging portion provided at the other end, said upper carrier portion being pivotable about a vertical axis.

4,982,870

COMPOSITE PRESSURE VESSEL

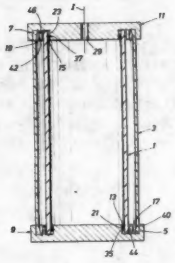
Petrus J. M. Van Loon, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 14, 1990, Ser. No. 522,700

Claims priority, application United Kingdom, Jul. 7, 1989, 8915622

Int. Cl.[5] B65D *1/16*

U.S. Cl. 220—414 **9 Claims**



1. A pressure vessel comprising a first cylindrical wall for bearing circumferential loads, a second cylindrical wall for bearing axial loads, said first and second walls being concentrically arranged, two end caps arranged at opposite ends of the vessel and rigidly connected to the second cylindrical wall, at least one of the end caps being axially slidable relative to the first cylindrical wall, and sealing means arranged between the first cylindrical wall and slidable end cap.

4,982,871

GASTIGHT CONTAINER FOR WARM STORAGE AND TRANSPORT

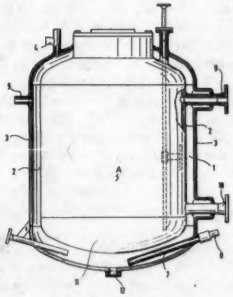
Manfred Kiecker, Huerth; Dieter Torke, and Ludwig Lange, both of Bruehl, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 12, 1989, Ser. No. 406,059

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 8811839

Int. Cl.[5] B22C *21/00*

U.S. Cl. 220—426 **10 Claims**



1. A container for storage and transport of molten metals which may contain solid impurities comprising:

a cylindrical middle section having lower and upper dished container ends, wherein a holding space is defined;

a double jacket defining a heat-transfer space, said jacket at least partially surrounding said holding space, for receiving a liquid heat-transfer medium;

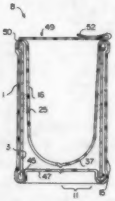
a ventilation connection through said double jacket;
a heat-transfer medium filling connection for introducing said heat-transfer medium into said heat transfer space;
a plurality of heat rod casings projecting into the heat-transfer space, whereby heat is transferred to the heat-transfer medium from a heat source which is placed in said casings;
an inlet and an outlet for introducing the molton metal into said holding space; and
an outlet connection for removing the heat-transfer medium from said heat-transfer space.

4,982,872

FILM-ENCAPSULATED-STRUCTURE CONTAINER FOR FOOD, BEVERAGES AND OTHER CONSUMABLE PRODUCTS AND METHOD FOR MAKING OF SAME

Donald J. Avery, 2129 Park Forest Dr., Chesterfield, Mo. 63017

Filed Dec. 15, 1988, Ser. No. 284,686
Int. Cl.[5] B65D *5/56, 25/14*
U.S. Cl. 220—461 **35 Claims**



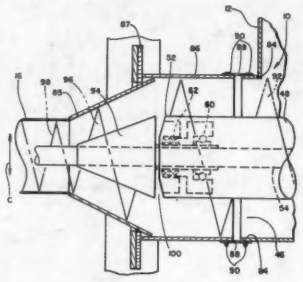
1. A material-recyclable container for safe packaging of food-grade contents, namely food, beverage and other food-grade consumable products, by use of recyclable non-food-grade material in protected barrier relationship with such contents while permitting recycling of such container for subsequent reincorporation by recycling, said container comprising a structure and a vessel within the structure for receiving contents of such character, characterized by:
the structure providing a vessel-and-contents-receptive configuration and for protecting the vessel and the contents against the stresses of processing, filling, warehousing, distribution, merchandising and customer use, the structure being formed of single or multiple thicknesses of at least one recyclable non-food-grade material to be encapsulated in safely protected relationship with said contents, the recyclable material being of the type to which the contents are not safely to be directly exposed,
a sheath of virgin food-grade film material having preselected barrier properties for encapsulating the structure to provide said protected relationship for the contents, the sheath having portions extending externally over the entirety of the structure and at least partially internally thereof,
the sheath portion internally of the structure defining said vessel within the structure for receiving the contents, the sheath interposing by said barrier properties a barrier between the structure and the contents and between the structure and the outside environment, the vessel having an opening,
at least the vessel-defining portion of the film material having walls of thin-walled character each of total thickness inadequate if the vessel were used alone as a container for the contents in the absence of the structure, whereby the food-grade virgin material primarily is not employed for protection against said stresses,
means bonding the vessel-defining portion of the film material at least internally within the structure, and
a closure for closing the vessel opening, the closure also having barrier properties such that the closure closes off the barrier between the structure and the contents, whereby said container permits subsequent recycling and reincorporation of the materials of the container following said recycling for structural purposes in a further such container.

4,982,873

TWO-STAGE AUGER SYSTEM FOR FILLING COMMERCIAL VALVE BAGS

Robert G. Kelley, South Jordan; R. Phillip VanAusdal, and Christopher S. Wadium, both of Salt Lake City, all of Utah, assignors to Stone Container Corporation, Chicago, Ill.

Filed Oct. 7, 1988, Ser. No. 255,364
Int. Cl.[5] G01G *13/02;* **B65G** *33/32*
U.S. Cl. 222—77 **11 Claims**



1. In a two-stage auger system for filling a valve bag with particulate materials from a hopper through a valved opening in the bag, the auger system comprising: a first hollow shaft carrying a first set of flights dimensioned and pitched for low speed movement of the material out of the hopper and a second shaft extending through and protruding from the first shaft carrying a second set of flights on its protruding portion dimensioned and pitched for higher speed movement of the material from said first set of flights, a filling tube fastened to said hopper and cooperating with said second shaft and said second set of flights for higher speed discharge of said material from said hopper through said filling tube into the bag through the valved opening, bearing means for rotationally seating said second shaft member within said first shaft member at opposite ends of said first shaft member to that said second shaft member can rotate within said first shaft member, sealing means for sealing said bearing means to prevent material from reaching said bearing means, driving means for rotating said first and second shafts, and a third set of flights which are variably dimensioned and pitched and positioned between said first and second sets of flights of said first and second shafts on said second shaft so that said variably dimensioned and pitched flights carry said material between said first and second sets of flights of said first and second shafts, scrape material from the inner wall of the hopper and direct material away from said sealing means.

4,982,874

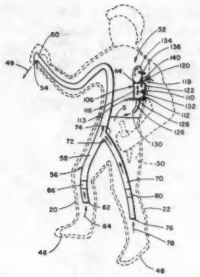
SHAMPOO DISPENSING CONTAINER

William Pringle, 2769 Hidden Oak Dr., Johns Island, S.C. 29455

Filed Jan. 8, 1990, Ser. No. 462,736
Int. Cl.[5] B67D *1/04*
U.S. Cl. 222—78 **2 Claims**

1. A dispensing container for shampoo comprising
(A) a human form figure having a hollow body which includes
(1) a trunk portion,
(2) first and second legs attached to said trunk portion,
(3) first and second feet attached to said first and second legs respectively,

(4) first end second arms attached to said trunk portion,
(5) first and second hands attached to said first and second arms respectively,
(6) said first arm being rotatably connected to said trunk section to move from a cocked position to a shampoo dispensing position, and
(7) a liner fixedly attached to an inner surface of said body to define an air-tight compartment within said body;
(B) liquid shampoo contained within said air-tight compartment;
(C) a shampoo dispensing assembly which includes
(1) a dispensing nozzle mounted on said second hand:
(2) a fluid conduit system fluidically connecting said dispensing nozzle to said liquid shampoo, said fluid conduit system including
(a) a first fluid conduit having an outlet connected to said dispensing nozzle, an inlet located in said first leg near said first foot,
(b) a first one-way fluid valve in said first fluid conduit and oriented to permit flow of said shampoo from said first fluid conduit inlet toward said first fluid conduit outlet,
(c) a second fluid conduit having an outlet fluidically connected to said first fluid conduit at a location between said first one-way fluid valve and said first fluid conduit outlet and an inlet located in said second leo near said second foot,
(d) a second one-way fluid valve in said second fluid



conduit and oriented to permit flow of said shampoo from said second fluid conduit inlet toward said second fluid conduit outlet, and
(e) a compartment pressurizing system which includes
(i) a bellows mounted on said body inside said air-tight compartment and having an air conduit with an air inlet located outside of said body and an air outlet located inside said bellows to draw ambient air into said bellows, said bellows having a first end and a second end,
(ii) a one-way air valve in said air conduit and being oriented to permit air to flow into said bellows in said air conduit but to prohibit air from flowing out of said bellows via said air conduit,
(iii) a pivot pin mounted on said first arm for rotation therewith,
(iv) a cam rotatably mounted on said pivot pin for rotation therewith to contact said bellows second end to compress said bellows in conjunction with said first arm moving from said cocked position to said dispensing position and to permit said bellows to recover as said first arm moves back from said dispensing position to said cocked position, and
(v) an air outlet conduit having an inlet fluidically connected to said bellows second end to receive air from said bellows as said bellows is compressed and having an outlet located inside of said air-tight compartment to direct air from said bellows into said air-tight compartment to pressurize said air-tight compartment and to force shampoo into said first and second fluid conduits to move to said dispensing nozzle

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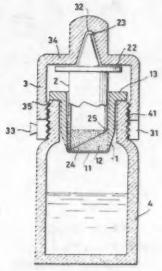
4,982,875

CAP, RESERVOIR AND DROPPER ASSEMBLY FOR BOTTLES

Franco Pozzi, Como, and Angelo Carenzi, Busto Arsizio VA, both of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Filed Aug. 1, 1986, Ser. No. 892,909
Claims priority, application Italy, Aug. 2, 1985, 21845A/85
Int. Cl.[5] B65D *47/18;* A61M *37/00*
U.S. Cl. 222—83 **2 Claims**



1. A cap, reservoir and dispensing dropper assembly for a bottle comprising:
a reservoir having a first end portion adapted to fit within the opening in a bottle and having a second end forming a collar adapted to rest on the mouth of the bottle, the first end of the reservoir being closed by a closure wall and the second end being open;
a hollow piston slidably fitted in the open end of the reservoir, the piston having a first end adapted to cut said closure wall when forced against the latter and having a second end fitted with a dropper;
a cap having a side wall adapted to releasably connect with the exterior of the neck of the bottle and an imperforate end wall which overlies the second end of said piston, whereby said dropper is protected from contamination when said assembly is connected to the bottle by said cap;
said second end of said piston including a circumferential collar;
said side wall of said cap being internally threaded so as to be threadedly engaged with external threads on a bottle neck; and
said cap having an internal surface which, upon screwing of said cap on to the bottle a predetermined distance, engages said piston collar and forces the piston in a direction to cut said closure wall, the arrangement being such that further tightening of said cap forces said piston collar into sealing engagement with said reservoir collar.

4,982,876

CARBONATION APPARATUS

Alistair Scott, Cambridge, United Kingdom, assignor to Isoworth Limited, England

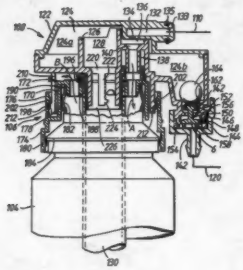
Continuation-in-part of Ser. No. 85,480, Aug. 13, 1987, abandoned, which is a division of Ser. No. 946,841, Dec. 29, 1986, Pat. No. 4,726,494. This application Aug. 8, 1988, Ser. No. 229,643
Claims priority, application United Kingdom, Feb. 10, 1986, 8603227; May 17, 1988, 8811604; Jul. 11, 1988, 8816477
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **30 Claims**

1. A bottle having upper and lower portions, the bottle containing concentrate for flavouring a carbonated drink in

said lower portion and having a gas space in said upper portion, the bottle comprising:

structure defining a concentrate outlet, a concentrate and gas return inlet and a gas outlet remote from said concentrate and gas return inlet; and

securement means for attaching the bottle to carbonating apparatus of the type having a concentrate inlet and a gas and concentrate return so that the concentrate inlet of the



carbonating apparatus is connected to said lower portion through said concentrate outlet, the gas and concentrate return of the carbonating apparatus is connected to said gas space through said concentrate and gas return inlet and said gas space is vented to the atmosphere through said gas outlet, said securement means comprising inwardly directed latch means disposed outwardly of said structure and at a position below an upper extremity thereof.

4,982,877

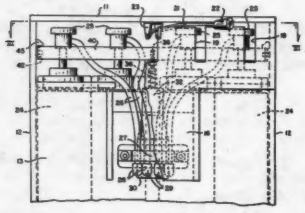
REPLACEABLE CONTAINER FOR FLUID DISPENSER

John W. Burton, 4 Woodland Dr., Pittsburgh, Pa. 15228

Continuation-in-part of Ser. No. 41,214, Apr. 22, 1987, Pat. No. 4,793,518. This application Dec. 21, 1988, Ser. No. 287,723

Int. Cl.[5] B67D *5/56*

U.S. Cl. 222—321 **7 Claims**



1. A removable fluid container for use in a dispenser of the type comprising a housing having a base and a front, wherein an opening is provided in the front through which liquids can be dispensed, a first slot and at least one second slot extending at an angle from the first slot provided in the front, the housing being sized to hold at least one container having a plunger type pump attached to the container and a tube extending from the pump to the opening at the front plate, a nozzle attached to the housing in a manner to allow liquid to flow through the nozzle and out of the opening in the front plate, a valve attached to the nozzle having an outwardly extending stem movement of which opens and closes the valve and having an inlet which may be connected to a liquid supply, a bar pivotally attached to the housing, said bar extending substantially parallel to the first slot and attached to the valve stem so that movement of the bar will move the valve stem to open the valve, and a lever attached to the housing in a manner so that it may extend and move through the first and second slots and sied and positioned so that it will engage and activate a plunger type pump and the bar when moved downwardly through a second slot, the fluid container being generally rectangular in shape, comprising:

a top, a bottom and four sidewalls extending between the top and bottom, the top having a recessed portion extending across one end and touching three of the sidewalls and having a top surface at an opposite end;

a neck centered on and extending outwardly from the recessed portion and perpendicular to the top surface, the neck adapted to receive a plunger type pump whereby the pump will be positioned in alignment with the lever when the container is inserted within the dispenser and the lever is positioned within an associated slot of the dispenser;

a closure attached to the neck to seal the container, the neck and closure being sized to terminate in a plane which extends through the top surface; and

a plunger type pump attached to the neck, the neck and pump sized and mounted at such a height so that when the container is in the dispenser, and the lever is engaged to activate the pump, the bar will move the valve stem to open the valve when the lever has traveled 85% of its total stroke.

4,982,878

SEALING METHOD AND CONTAINER ASSEMBLY WITH IMPROVED SEAL

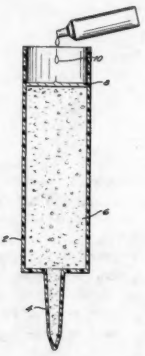
Arno P. O. Schmidt, Abstatt, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jul. 13, 1988, Ser. No. 218,668

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1987, 3723088

Int. Cl.[5] G01F *11/20*; B05D *3/10*

U.S. Cl. 222—327 **19 Claims**



1. A method for sealing a container which is capable of being closed, but which does not contain an air-tight seal and which contains a flowable composition sensitive to air or moisture, comprising applying to the area of the container requiring a seal a material capable of causing a reaction with the flowable composition and by the reaction creating a protective layer on the flowable composition, whereby a protective sealing layer is formed when the flowable composition and the material applied are brought into contact which prevents air and moisture from reaching the flowable composition.

11. In a closable container useful for holding and applying a flowable composition which is sensitive to air or moisture, comprising a cartridge containing the flowable composition and a piston inserted in one end of the cartridge capable of plunging into the cartridge and expressing a flowable composi-

tion therefrom, the improvement comprising a protective sealing layer on the surface of the flowable composition normally in contact with the piston, wherein the protective sealing layer is produced by applying to the surface of the flowable composition and capable of causing a reaction with the flowable composition and thereby forming a protective layer effective to seal the cartridge and the piston and prevent air and moisture from passing into the cartridge.

4,982,879

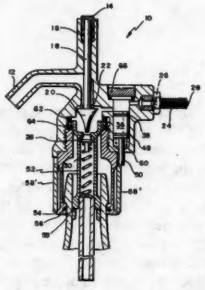
BOTTLE CONTENTS DISPENSING AND CONTENTS PRESERVATION APPARATUS

Pat Corrado, St. Petersburg, and Stephen Corrado, Seminole, both of Fla., assignors to APF Industries, St. Petersburg, Fla.

Continuation of Ser. No. 456,193, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 204,303, Jun. 9, 1988, abandoned. This application May 23, 1990, Ser. No. 526,955

Int. Cl.[5] B67D *5/08*

U.S. Cl. 222—400.7 **5 Claims**



1. Bottle contents dispensing apparatus comprising a body portion having an outlet chamber, an outlet nozzle in selective communication with the outlet chamber, a manual valve between the outlet chamber and the outlet nozzle, said body portion including a fitment to be inserted in the neck of a bottle, a split skirt surrounding the fitment in spaced relationship, a cylindrical locking ring about the split skirt, said locking ring longitudinally slidable from a position wherein the split skirt is held tightly against an outer surface of the bottle neck to a position wherein the split skirt is free of contact with the outer surface of the bottle neck and means for pressurizing the outlet chamber and a bottle connected to the dispensing apparatus, and wherein the locking ring is held in the position where the split skirt is held tightly against the outer surface of the bottle neck by a piston and piston rod, which engage the locking ring.

4,982,880

CONTAINER AND TEAT FEEDING ASSEMBLY

Corinne Angeloz, Thun; Peter Huerlimann; Rudolf Schmied, both of Konolfingen, and Eugene Van Meir, Fribourg, all of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Continuation-in-part of Ser. No. 281,086, Dec. 7, 1988, Pat. No. 4,930,690. This application Sep. 6, 1989, Ser. No. 403,614

Claims priority, application European Pat. Off., Sep. 7, 1988, 88114545.2

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] A61J *9/00*

U.S. Cl. 222—490 **16 Claims**

1. A container and teat feeding assembly comprising:

a container having:

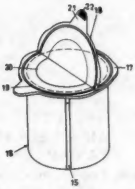
(i) a base integral with lateral walls reinforced with a cover foil extending from the base to an edge defining an upper open end;

(ii) a rim integral with and having upper and lower surfaces extending to a rim edge away from the open end edge of the lateral walls in a plane parallel with a plane of the open end of the container defined by the edge of the lateral walls;

(iii) at least three projections integral with the rim extending from the rim edge away from the open end wherein one of the projections extends from the rim edge away from the open end beyond the other projections; and

(iv) a lid for covering the open end of the container peelably sealed to the upper surface of the rim and having a grip tab extending from the lid and being positioned for communication with and partly separated from an upper surface of the projection which extends beyond the other projections;

a teat having a base seated on the rim of the container; and a locking ring having:



(i) a ring lip abutting an upper surface of the lid about the upper surface of the rim extending from the open end edge to a lip edge beyond the rim edge away from the open end and having a groove at the open end edge from accommodating and securing the base of the teat within the groove between the lip and the upper surface of the lid about the rim;

(ii) a ring skirt integral with and extending perpendicularly from the lip edge about the rim edge and having a recess from accommodating the rim projections; and

(iii) lugs integral with and extending perpendicularly from the skirt towards the lateral walls corresponding in number with the container rim projections and configured and positioned for, together with the recess, locking engagement with the rim projections.

4,982,881

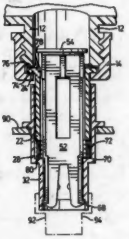
NOZZLE FOR A LIQUID CONTAINER

John E. Amrein, R.R. #1, Colgan, Ontario, Canada (L0G 1G0)

Filed Dec. 18, 1989, Ser. No. 451,836

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—514 **20 Claims**



1. A nozzle for a liquid container, which nozzle comprises: a first nozzle part including a flange for engaging a collar; a sealing member abutting the flange and including a first sealing

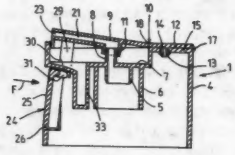
surface for abutting a neck of a container and a second sealing surface; a second nozzle part including an outlet opening and slidably engaging the first nozzle part; spring biasing means acting between the first and second nozzle parts and urging the second nozzle part away from the flange of the first nozzle part; and a valve member secured to the second nozzle part and including a closure member adapted to abut the second sealing surface under the action of the spring means, whereby, in use, the second nozzle part and the valve member can be displaced towards the flange and the first part valve part against the action of the spring means, to displace the closure member away from the second sealing surface, to permit fluid to flow through the nozzle.

4,982,882

CAP FOR DISPENSING A FLUID OR VISCOUS PRODUCT, AND CONTAINER EQUIPPED WITH SUCH A CAP

Jean-Louis Gueret, Paris, France, assignor to L'Oreal (A Joint Stock Company constituted under French Law), Paris, France

Filed Dec. 23, 1988, Ser. No. 288,878
Claims priority, application France, Dec. 24, 1987, 8718152
Int. Cl.[5] B65D *3/00*
U.S. Cl. 222—531 **9 Claims**



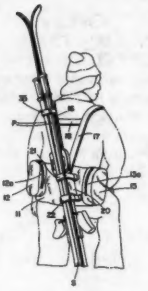
1. A cap for dispensing a fluid or viscous product, intended for being mounted on the neck of a container containing the product, the cap including a wall and a short tube for engaging the neck and being supported by a horizontal top associated with a nozzle projecting from a side of the top opposite the short tube, the nozzle communicating with the interior of the container, the cap also including passageway means for dispensing the product to the outside and means for closing and opening said passageway means, said opening means including a lid in the form of a small plate mounted pivotably about an axis substantially orthogonal to that of the short tube, the lid being arranged to move to a closed position to close the nozzle, the passageway means including a conduit provided in the lid and discharging to the outside of said lid, said conduit communicating with the nozzle, characterized in that the opening means include a pushbutton arranged to cause the lid to pivot about its axis from the closed position to an open position; said pushbutton being provided in the wall of said cap, said pushbutton being movable between actuated and deactuated positions and said lid extending generally in a plane and having an underside beneath said conduit with ram means provided on said underside extending away from said conduit positioned to cooperate with said pushbutton so that, when said pushbutton is moved from said deactuated to said actuated positions, said pushbutton will engage said ramp means to move said ramp means and thereby said lid to an opened position, said pushbutton being independent of said lid.

4,982,883

SKI AND POLE CARRIER

Pramode N. Ullal, P.O. Box 1827, Aptos, Calif. 95001-1827, and Frederick F. Kazmierczak, 1463 Menorea Ct., San Jose, Calif. 95120

Filed Sep. 1, 1989, Ser. No. 402,481
Int. Cl.[5] A45F *3/04*
U.S. Cl. 224—209 **3 Claims**



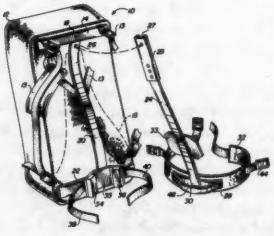
1. An apparatus for carrying objects on a person below the small of the back of the person, said apparatus comprising: a padded belt which encircles the waist of the person, wherein said belt distributes the weight of said objects to the hips of the person, said belt having inner and outer sides, an inner space, first and second ends, and an axis extending through said belt and passing through said ends; a pair of shoulder straps attached to said belt; a base firmly attached to said belt and located within said inner space; a support for skis rigidly mounted on said base and disposed at an angle with respect to said axis, said support having means which projects through said outer side of said belt for aligning and guiding skis with respect to said support; means for fastening ski poles and skis to said base and said support.

4,982,884

BACKPACK CARRIER ASSEMBLIES

Stephen A. Wise, King George St., #16, Jerusalem, Israel (94229)

Filed Mar. 18, 1986, Ser. No. 840,927
Int. Cl.[5] A45F *3/08*
U.S. Cl. 224—211 **27 Claims**



1. A backpack or support assembly adapted to be worn by a user, comprising:

(a) a backpack adapted to be at least partially supported or stabilized by the upper torso of the user;

(b) a belt dimensioned to fit about the waist of the user;

(c) means pivotably coupling said belt with said backpack at or above the center of gravity of said backpack; and wherein

(d) the backpack is free to swing from side to side behind the hips of the user and about said pivotal coupling means.

4,982,885

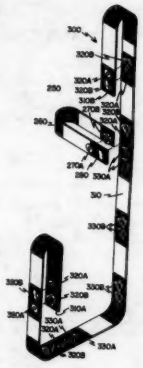
INTERACTIVE COUPLING DEVICES

Sandra S. Severson, and Larry E. Severson, both of 724 Second St. N.W., Waseca, Minn. 56093, assignors to Larry Severson and Sandie Severson, both of Waseca, Minn.

Filed Mar. 13, 1989, Ser. No. 322,566

Int. Cl.[5] A45F *5/00*; A45C *11/00*

U.S. Cl. 224—253 **10 Claims**



1. An apparatus, comprising: (i) a longitudinal length of material constructed from a single component and having first and second ends, (ii) a first unfastenable fastening means proximate the first end for forming a first longitudinal loop of the longitudinal length of material when fastened, (iii) a second unfastenable fastening means compatible with the first unfastenable fastening means and proximate the second end for forming a second longitudinal loop of the longitudinal length of material when fastened, and (iv) a third fastening means compatible with and intermediate the first and second fastening means suitable for (aa) looping the longitudinal length of material between the first and second fastening means so as to form a third longitudinal loop from the longitudinal length of material when fastened and thereby decrease the longitudinal length of the longitudinal length of material, and (bb) forming primary and secondary longitudinal loops at the first and second longitudinal ends of the longitudinal length of material when fastened to the first and second fastening means respectively.

4,982,886

ARTICLE CARRIER

John S. Cucheran, Lake Orion, Mich., assignor to John Anthony Bott, Grosse Pointe Shores, Mich.

Filed Mar. 27, 1989, Ser. No. 328,864

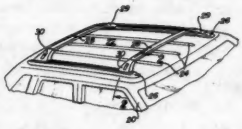
Int. Cl.[5] B60R *9/00*

U.S. Cl. 224—321 **20 Claims**

1. An article carrier for an automobile comprising:

a plurality of parallel slats fixedly secured on a generally horizontally extending exterior automobile body surface, said slats extending generally longitudinally of the automobile and having a bottom portion adapted to be disposed n generally facing relation toward the automobile body surface and defining an inner edge and outer edge and an outer side portion extending upwardly from said outer edge and an inner side portion extending upwardly from said inner edge and including a channel spaced from said inner and outer side portions;

a pair of bracket member having a bottom surface disposed upon certain of said slats and at least one foot extending from said bottom surface and adapted to slide along said channel, and a restraining bar extending laterally between and secured adjacent its opposite ends to said bracket members; and



at least one of said bracket members including means moveable relative to said bracket members and cooperable with a portion formed on said inner side portion of said slat for detachably securing and allowing longitudinal adjustment of said restraining bar and bracket members at various positions along said slats.

4,982,887

TAG SIZE DIFFERENTIATING SYSTEM FOR CONTINUOUS TAG PRINTING MACHINES

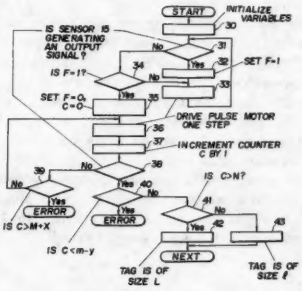
Mitsuharu Takahashi, Kanagawa, Japan, assignor to Kabushiki Kaisha Sato, Japan

Continuation of Ser. No. 492,390, May 6, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,403

Claims priority, application Japan, May 11, 1982, 57-77561

Int. Cl.[5] B65H *43/08*; B41J *15/06*; B41L *45/12*

U.S. Cl. 226—24 **15 Claims**



1. A machine for determining the length of individual tags forming part of a continuous tag web, said continuous tag web having equally spaced indicia thereon, each of said indicia having a leading portion, a trailing portion, and a central portion, the spacing of said indicia being indicative of the length of said individual tags, said machine comprising:

(a) a sensor for generating an indicia detect signal whenever any portion of one of said indicia is adjacent said sensor;

(b) a web advancing mechanism for advancing said web past said sensor; and

(c) a circuit for detecting indicia detect signals generated by said sensor, monitoring the movement of said web by said web advancing mechanism, and determining which of at least two possible lengths said tags are, as a function of both the distance said web advancing mechanism has moved said web between a trailing portion of one and a leading portion of another of said length-indicating indi-

cia, and the indicia detect signals said sensor has generated;

(d) the monitoring of said web movement commencing with the termination of an initial indicia detect signal corresponding to a trailing portion of an initial one of such indicia, and

said circuit being inoperative for determining such lengths until such termination of such initial indicia detect signal, such that said movement is not monitored prior to or during generation of such initial indicia detect signal.

4,982,888

APPARATUS FOR ATTACHING FASTENER ELEMENTS TO A GARMENT

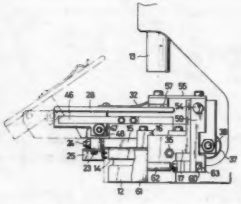
Sumio Toyota, and Takeshi Arai, both of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 375,929

Claims priority, application Japan, Jul. 8, 1988, 63-171399

Int. Cl.[5] A41H *37/02*

U.S. Cl. 227—18 **7 Claims**



1. An apparatus for attaching fastener elements one at a time to a garment, comprising:

(a) vertically movable punch; and

(b) a die plate disposed below said punch and having a plurality of dies spaced apart in a first direction, said die plate being slidably movable in said first direction to place said dies successively into alignment with said punch, said die plate being displaceable in a second direction away from said punch in a plane of sliding movement of said die plate, said second direction being perpendicular to said first direction, said ie plate being pivotally movable about an axis parallel with said first direction plane when it is disposed in a position remote from said punch, said die plate being tiltable upwardly as it is displaced in said second direction away from said punch.

4,982,889

FLOATING DUAL DIRECTION SEAL ASSEMBLY

Edward P. Eardley, North Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 9, 1989, Ser. No. 391,166

Int. Cl.[5] F16J *15/48*

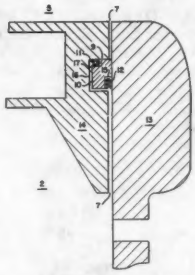
U.S. Cl. 277—27 **7 Claims**

1. A floating dual direction seal assembly for sealing high and low pressure regions at the interface between mating parts of turbomachinery comprising:

(A) a ring positionable between said mating parts in an annular groove within one of said mating parts and moveable axially at the interface between the mating parts;

(B) a radial seal on the ring placeable radially adjacent one of the mating parts, said radial seal comprising a self-actuating member oriented on the ring for exposure to the high pressure;

(C) an axial seal on the ring placeable axially adjacent the other of the mating parts, said axial seal comprising a self-actuating member oriented on the ring for exposure to the high pressure; and



(D) a raised section on the ring in contact with an axially facing surface of the annular groove serving to space the ring from said surface of the annular groove.

4,982,890

SOLDERING MEANS HAVING AT LEAST ONE STIRRUP ELECTRODE AND TWO SOLDERING WEBS LYING OPPOSITE ONE ANOTHER OR FOUR SOLDERING WEBS LYING OPPOSITE ONE ANOTHER IN PAIRS

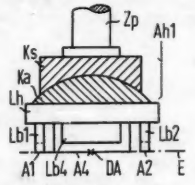
Rudolf Schuster, Heimstetten; Josef Raschke, Gelting, and Klaus Kamperdicks, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 1, 1989, Ser. No. 444,831

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1989, 3900520

Int. Cl.[5] B23K *3/00, 3/03*

U.S. Cl. 228—44.7 **5 Claims**



1. In a soldering device of the type in which at least one soldering stirrup electrode adapted to be heated by electrical resistance heating is carried by a soldering stirrup holder and comprises a plurality of soldering webs lying opposite one another in pairs and include working surfaces which lie in one plane, the improvement therein comprising:

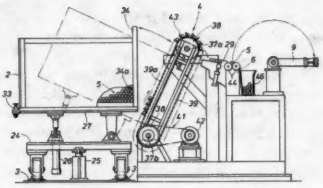
a flexible suspension mounting the soldering stirrup holder for movement about a pivot and compensation center which lies centrally in the one plane of the working surfaces.

4,982,891

METHOD AND SYSTEM FOR FORMING A THREE-DIMENSIONAL FRAME STRUCTURE

Shizuo Kimura; Yukihisa Watano; Sachihiro Yamashita, and Masayuki Enomoto, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,005
Claims priority, application Japan, Aug. 3, 1988, 63-193953
Int. Cl.[5] B23Q *41/02*
U.S. Cl. 228—47 5 Claims



1. A system for producing a three-dimensional frame structure from a rod-like member, comprising:

a work feed station for individually feeding a rod-like member;

a bending station for bending said rod-like member having a prescribed length fed from said work feed station into a two-dimensional framed structure;

a welding station for welding two mutually abutting parts of said two-dimensional frame structure of said rod-like member transferred from said bending station together; and

a forming station for plastically forming said two-dimensional frame structure into a three-dimensional frame structure;

wherein said work feed station comprises a bin for storing a plurality of rod-like members in mutually parallel relationship, an actuator for tipping said bin around a center line extending in parallel with said rod-like member toward said elevator and an elevator located adjacent to said bin, said bin including a slot narrower than a length of said rod-like member and extending vertically along a substantially entire height of a side of said bin facing said elevator, and said elevator including endless chain means carrying a plurality of arm members which project into said bin through said slot and are adapted to be moved substantially in upward direction along said slot.

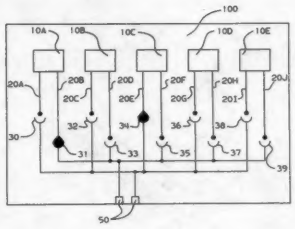
4,982,892

SOLDER INTERCONNECTS FOR SELECTIVE LINE COUPLING

Anthony J. Parla, Charlotte, and Howard F. Tepper, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1989, Ser. No. 437,156
Int. Cl.[5] B23K *101/42*; H05K *3/34*
U.S. Cl. 228—180.1 6 Claims

1. A method of mounting at least one module having a plurality of output leads on a printed circuit board having a plurality of interconnection lines formed thereon, each of the plurality of interconnection lines terminating at one end with a lead acceptor site, and at least some of said interconnection lines having interconnect pads therebetween, comprising the steps of arranging a mask over the printed circuit board so as to expose at least some of the lead acceptor sites and selected ones of said interconnect pads, and depositing solder through said mask so as to bond the plurality of output leads of the module to respective ones of the lead acceptor sites while



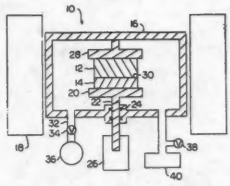
simultaneously forming connections between selected ones of said plurality of interconnection lines.

4,982,893

DIFFUSION BONDING OF TITANIUM ALLOYS WITH HYDROGEN-ASSISTED PHASE TRANSFORMATION

Duane L. Ruckle, Mesa; Thomas E. Strangman, Phoenix, and Robert J. Keiser, Cave Creek, all of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Aug. 15, 1989, Ser. No. 394,708
Int. Cl.[5] B23K *20/02, 20/16*
U.S. Cl. 228—220 9 Claims



1. A process for bonding together two pieces of metal, comprising the steps of:

furnishing the two pieces of metal to be bonded, at least a first piece of which is selected from the group consisting of titanium and an alloy of titanium;

introducing hydrogen into at least the first piece of metal to reduce its flow stress at an elevated bonding temperature; and

pressing the two pieces together under an applied bonding pressure and at the elevated bonding temperature, said step of introducing hydrogen to be accomplished concurrently with said step of pressing.

4,982,894

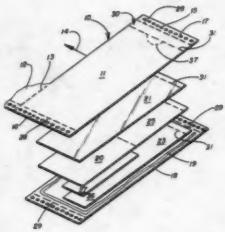
MAILER WITH I.D. CARD AND METHOD

Eric Schmidt, Elgin, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Oct. 2, 1989, Ser. No. 415,877
Int. Cl.[5] B65D *27/10*
U.S. Cl. 229—69 11 Claims

1. A mailer I.D. product comprising a series of connected stuffed envelope assemblies having continuous top and bottom plies equipped with longitudinally extending control margins and transverse lines of perforation defining individual envelope assemblies, an insert ply within each envelope assembly captured along only one longitudinal side, said insert ply including card stock having longitudinal and transverse lines of perforation therein defining an I.D. card, a pressure sensitive adhesive equipped transparent film having a first portion attached to said card stock, the second portion of said film being held in face-to-face relation with said card stock by confinement be-

tween said top and bottom plies, said second portion of said film being equipped with a release liner over said pressure



sensitive adhesive whereby upon removal of said release liner said film is movable into covering relation with said I.D. card.

4,982,895

HEATING SYSTEM FOR AUTOMOTIVE VEHICLES

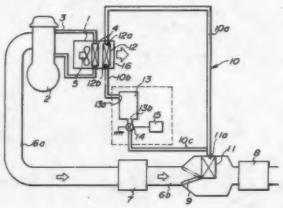
Joji Shimizu; Yuji Chujo, both of Kanagawa; Yasushi Yamamoto, Tokyo, and You Noda, Kanagawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

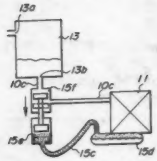
Filed Oct. 31, 1989, Ser. No. 429,222

Claims priority, application Japan, Oct. 31, 1988, 63-276934; Oct. 31, 1988, 63-143285[U]; Nov. 18, 1988, 63-150330[U]

Int. Cl.[5] G05D *23/00*

U.S. Cl. 237—2 A 19 Claims





1. A heating system for automotive vehicles comprising:

a heater core connected to a fluid supplied cooling jacket of an engine through an intake fluid passage for introducing coolant from the engine cooling jacket to the heater core and a return fluid passage for returning the engine coolant from the heater core to the cooling jacket;

a blower disposed upstream of said heater core, for providing air flowing through said heater core;

a closed-loop pipe heating system comprising;

an evaporator section disposed in an exhaust passage for exhaust gas, for utilizing a portion of heat included in the exhaust gas;

a condenser section disposed downstream of said heater core, for transmitting said portion of exhaust heat to the air flowing through said heater core;

pipe means including a pipe section defining a first fluid passage from said evaporator section to said condenser section and a return pipe section defining a second fluid passage from said condenser section to said evaporator section;

working fluid means circulating in said closed-loop pipe heating system, for transmitting said portion of exhaust heat from said evaporator section to said condenser section;

valve means disposed in said return pipe section, for establishing or blocking flow of said working fluid means flowing through said second fluid passage; and

valve control means associated with said valve means in such a manner as to fully open said valve means when atmospheric temperature in said evaporator section is less than a predetermined temperature at which said working fluid means in said evaporator section transits from a liquid state to a gaseous state.

4,982,896

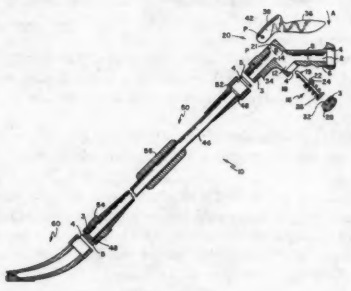
SPRAY WAND

Lee Crow, 8218 Cordelia Cir., Citrus Heights, Calif. 95621

Filed Oct. 17, 1988, Ser. No. 259,185

Int. Cl.[5] B05B *1/04*

U.S. Cl. 239—11 8 Claims



1. A fluid dispensing device comprising, in combination: a nozzle through which the fluid passes, an upstream conduit connected to said nozzle at one end and valve means at an opposite end, said valve means having a valve gate and a valve seat dimensioned such that, when said valve means is open, allowing the fluid to pass therebeyond, flow rate on both sides of said valve means is substantially equal,

wherein said valve means includes a handle portion, a valve cavity and associated valve housing portion, and a barrel portion, passageways in said barrel and an interior of said handle of substantially identical circular cross-section, said handle including a trigger grip carried on a top surface and undulations on a bottom surface to facilitate manually grasping said handle, said trigger grip including a top wall overlying a portion of said barrel and downwardly extending side walls, said trigger grip pivoted to said barrel portion and said trigger grip's cylindrical interior communicating with an opening in said valve housing portion,

wherein said valve housing portion and said opening receives a free end of a valve stem to pass therethrough and underlie said trigger top wall, an O-ring circumscribing a portion of said stem and adjacent said top wall and in fluid-tight communication with an O-ring seat thereat, a valve wall medially disposed on said valve stem supporting a valve seal on a surface proximate to said O-ring, said valve seal juxtaposed to an integrally formed valve seat carried in said valve housing portion, whereby reciproca-

tion of said valve stem by said trigger grip moves said valve seal and associated valve wall away from said valve seat from a closed to an open position,

wherein said valve stem further includes a portion extending from said valve wall remote from said valve seal, said last named stem portion supporting a compression spring thereover and a free end of said compression spring residing within a recess carried on an end cap threadedly connected to a portion of said valve housing, whereby releasing said trigger grip automatically closes said valve,

wherein said nozzle received fluid from said pistol grip and has an interior of circular cross section, and an end wall adjacent a nozzle slit is configured as a hemispherically shaped wall,

wherein said nozzle slit is a rectangular box-like passageway,

wherein said nozzle interior decreases in circular cross section as it approaches said hemispherical wall.

4,982,897

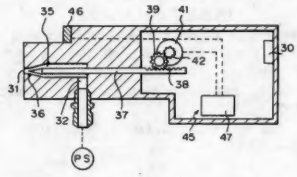
SPRAYING METHOD AND APPARATUS EMPLOYED THEREFOR

Yoshio Matusita; Takeshi Mochizuki, and Ikuya Shirashi, all of Kanagawa, Japan, assignors to Iwata Air Compressor Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1986, Ser. No. 897,028

Int. Cl.[5] B05B *7/12*

U.S. Cl. 239—71 **6 Claims**



1. A spray apparatus having a supply passage for a substance which is to be sprayed, a nozzle for jetting out the spray substance, and control valve means provided within said supply passage and adapted to control the flow rate of the spray substance flowing out through said nozzle, wherein the improvement comprises:

distance measuring means integral with said spray apparatus and adapted to measure the distance between said spray apparatus and an article in the direction from said spray apparatus toward the article and output a signal corresponding to the measured distance; and

drive means connected to said control valve means and to said distance measuring means for adjusting the degree of opening of said control valve means in response to said output signal.

4,982,898

DEVICE FOR PROJECTING A TREATMENT PRODUCT ONTO PLANTS

Patrick J. M. Ballu, Reims, France, assignor to Tecnoma, Epernay, France

Filed Jan. 5, 1990, Ser. No. 461,289

Claims priority, application France, Jan. 6, 1989, 89 00100; Jul. 4, 1989, 89 08958

Int. Cl.[5] B05B *7/00*

U.S. Cl. 239—77 **10 Claims**

1. Mobile device for treating plants, comprising:

a chassis,

a frame linked to said chassis and provided with substantially vertical slideways,

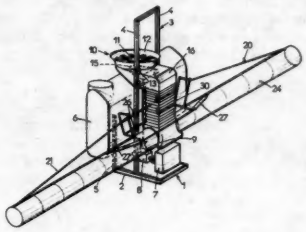
a boom bearing a series of atomization means arranged in a row in order to form a planar sheet of particles or droplets of a treatment product,

means for sliding the said boom or a support for the said boom along the said slideways,

a reservoir for said treatment product,

a pump and feed pipes for feeding the said atomization means,

a sleeve for air under pressure carried by the said boom and



provided with passages oriented so as to produce a stream of air in sheet form, the arrangement of the passages being such that said atomization means are external to the said stream of air, and that the latter forms an angle of less than 90° with the sheet of particles or droplets,

a fan mounted so as to be able to slide on the substantially vertical slideways without being fixed to the boom,

a deformable hose and/or a connector of adjustable length for connecting said fan to said sleeve.

4,982,899

DEVICE FOR REGULATING DISCHARGE VOLUMES OF A NOZZLE

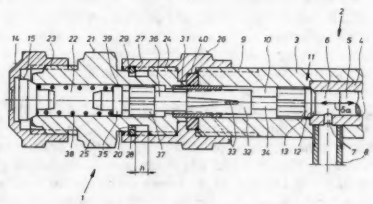
Ewald Kille, and Heinrich Griebel, both of Friedrichshafen, Fed. Rep. of Germany, assignors to J. Wagner, GmbH, Fed. Rep. of Germany

Filed Jun. 20, 1989, Ser. No. 368,590

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821212

Int. Cl.[5] B05B *1/30*

U.S. Cl. 239—329 **19 Claims**



1. In a device for regulating the quantity of pressurized medium emerging from a discharge nozzle of equipment, said device comprising means forming a delivery chamber disposed between the discharge nozzle and a feed pump, said feed pump having a pump housing with a pump chamber receiving a pump piston drivable in oscillation, said pump chamber having a port connected to a suction line extending to a reservoir of the medium and said pump chamber having an outlet valve with a movable valve member for communicating the pump chamber to said delivery chamber, the improvement comprising control means for adjusting the quantity of a medium flowing through the discharge nozzle including a control sleeve and a control piston, mounting means for axially adjust-

ably arranging said sleeve in said delivery chamber, said control piston being received in said delivery chamber and coacting with said sleeve, said control piston having a positive connection with the valve member of the outlet valve and being movable with the valve member of the outlet valve against the spring means biasing the valve member of the outlet valve to a position to close said outlet valve, said control means between the control sleeve and control piston being provided with a flow restricting aperture having an opening area which is adjustable in order to adjust the quantity of the medium flowing therethrough, the opening area of said aperture automatically being varied by movement of the control piston with the valve member relative to the control sleeve.

4,982,900

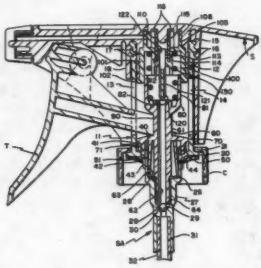
TRIGGER SPRAYER

William S. Blake, 14 Georgetown Ct., Linwood, N.J. 08221

Continuation of Ser. No. 194,296, May 16, 1988, abandoned. This application Jan. 24, 1990, Ser. No. 453,003

Int. Cl.[5] **B05B** *9/043*

U.S. Cl. 239—333 **33 Claims**



1. A dispenser pump to be mounted on a container for dispensing product from the container, comprising:

a pump housing having first means at one end defining an inlet chamber and second means at the other end defining an outlet chamber;

said first means including first movable means in the inlet chamber for alternately enlarging and decreasing the volume of the inlet chamber, and said second means including a second movable means in said outlet chamber for alternately enlarging and decreasing the volume of the outlet chamber;

means connected with said inlet chamber for flow of product into said inlet chamber from a container on which said pump is mounted;

flow passage means for flow of product from the inlet chamber to the outlet chamber;

retaining means engaged in said other end of the housing for retaining the first and second means in the housing;

said housing, said first and second movable means, said retaining means and said flow passage means comprising a subassembly which may be pre-assembled and inventoried for subsequent assembly with a container and actuator;

actuator means connected with said first and second movable means to move them together to pump product into the inlet chamber, from the inlet chamber to the outlet chamber and from the outlet chamber to be dispensed;

outlet valve means openable for flow of product from the outlet chamber when a predetermined pressure is reached in the outlet chamber; and

restrictor means in said flow passage means for restricting flow of product from the inlet chamber to the outlet chamber, whereby relatively slow movement of said first and second movable means in a direction to pressurize and dispense product from the outlet chamber results in flow of product from the outlet chamber to the inlet chamber, and relatively rapid movement of said first and second movable means in a direction to pressurize and dispense product from the outlet chamber results in opening of the outlet valve means and flow of product from the outlet chamber to be dispensed, said restrictor means thus providing a childsafety feature.

22. In a dispensing pump including a body with a nose piece having a forward end, a flow passage through the nose piece for product to be dispensed, and an adjustable nozzle carried on the nose piece for controlling flow from the passage and through the nozzle, the improvement comprising:

an elongate, forwardly projecting cylindrical body on the nose piece, said body having a central bore extending axially therethrough;

means on a forward end of the body for adjustable attachment of the nozzle;

a flexible, elongate, cylindrical nose piece valve sleeve engaged in said central bore; and

an elongate, double-ended nose piece valve having one end received in one end of said sleeve and the other end adapted to engage against the nozzle to preclude flow through the nozzle, said one end of said sleeve normally being sealingly engaged against said one end of said nose piece valve but being flexibly movable away from said nose piece valve under the influence of fluid pressure therein to enable flow past said nose piece valve and sleeve.

4,982,901

INJECTION VALVE

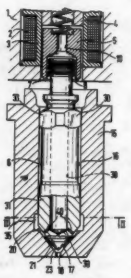
Volker Holzgrefe, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 14, 1987, Ser. No. 38,115

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624477

Int. Cl.[5] **F02M** *61/18, 61/04, 51/08*

U.S. Cl. 239—533.12 **4 Claims**



1. An injection valve for internal combustion engine fuel injection systems comprising a nozzle body having a guide bore therein for receiving a valve needle, said guide bore terminating in a conical valve seat having an adjacent discharge opening, said valve needle including peripheral guide portions adapted to guide same in said guide bore, said valve needle being provided with a blind bore, at least one transverse bore projecting normal to a longitudinal axis of said injection valve, at least one metering opening extending through said valve needle from said at least one transverse bore to permit a fuel flow from said blind bore and said at least one transverse bore to said at least one metering opening to allow fuel supplied to said injection valve to communicate with said discharge opening, said valve needle further provided with first and second conical sections at an extremity thereof adapted to cooperate with said valve seat, said second conical section having an outer wall, a portion of which defines an outwardly

projecting sealing seat, said sealing seat being arranged to cooperate with the valve seat to control opening and closing of the injection valve, and said at least one metering opening terminating in an outlet disposed immediately adjacent to and upstream from the sealing seat and facing said valve seat.

4,982,902

ELECTROMAGNETICALLY ACTUATABLE VALVE

Heinrich Knapp, Leonberg; Mathias Linssen, Scheblitz; Jürgen Peczkowski, INbert-Oberwürzbach, and Alfred Konrad, Bamberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

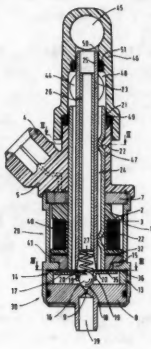
Filed Mar. 20, 1981, Ser. No. 245,846

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010612

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.[5] F02M *51/08, 55/00;* **F16K** *31/06*

U.S. Cl. 239—585 **9 Claims**



1. An electromagnetically actuatable fuel injection valve means for fuel injection systems of internal combustion engines, said valve means is connected with a fuel distributor line and a fuel return line separate therefrom and has a tubular outer inlet stub disposed concentrically with the valve means axis, arranged to communicate with said fuel distributor line and protruding into said valve means, a concentrically disposed tubular outlet stub extending upwardly from a zone in proximity to a valve including a valve seat and defining a flow cross section between said inlet stub and said outlet stub, said outlet stub has an end remote from said valve seat arranged to feed fuel into said fuel return flow line, a magnetic coil, said magnetic coil including an armature, at least said outer inlet stub protrudes through said magnetic coil, and said outlet stub includes a portion arranged to terminate near said armature of said magnetic coil.

4,982,903

PERISTALTIC VOLTAGE BLOCK

Chris M. Jamison, and Eric A. Petersen, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

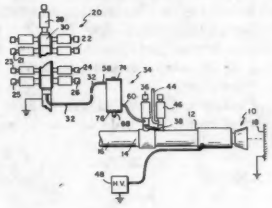
Continuation-in-part of Ser. No. 208,774, Jun. 17, 1988, Pat. No. 4,878,622. This application May 31, 1989, Ser. No. 357,851

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] B05B *5/02;* **F04B** *43/12*

U.S. Cl. 239—690.1 **21 Claims**

1. A coating material dispensing system comprising an electrostatic high potential supply having an output terminal on which the supply maintains a high electrostatic potential, a source of coating material, a dispenser for dispensing the coating material, means for coupling the dispenser to the source of coating material, means for coupling the output terminal to the dispenser to supply potential to the coating material dispensed by the dispenser, and means for providing a flow of coating material from the source to the dispenser, the means for coupling the dispenser to the source of coating material including



a device for substantially dividing the coating material being delivered to the dispenser at any given time into a plurality of discrete slugs of coating material substantially to interrupt the electrical path through the coating material from the terminal to the coating material supply.

4,982,904

SCREEN FOR COMMINUTING MACHINES

Gabriele Greiner, Mönchengladbach, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik G.m.b.H., Dusseldorf, Fed. Rep. of Germany

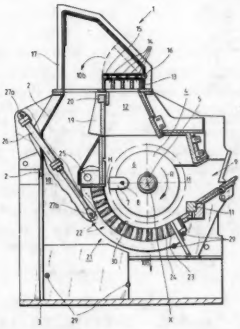
Continuation of Ser. No. 76,278, Jul. 22, 1987, Pat. No. 4,836,457. This application Jan. 18, 1989, Ser. No. 298,568

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624826

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] B02C *13/286*

U.S. Cl. 241—73 **5 Claims**



1. In a comminuting machine, in particular for comminuting waste and recyclable materials, ores and stones, wherein a rotor having comminuting tools thereon is rotatably mounted about a horizontal axis within a housing body and the housing body has an inlet and at least one outlet region for discharging comminuted material with at least one grate having grate openings of a maximum effective size being arranged in the outlet region, the improvement comprising:

at least one of the at least one outlet region having arranged therein said grate formed of a plurality of layers arranged so as to form cooperating elements for controlling the size of the grate openings, at least one of said layers being supported so as to be inwardly and outwardly pivotable,

at least one of said layers having said grate openings which are closable or size variable by pivoting a closing or a size varying portion of another layer.

4,982,905

APPARATUS FOR CRUSHING MATERIALS

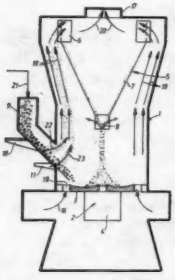
Dietmar Holsiepe, Ennigerloh; Ludger Lohnherr, Oelde; Hans-Dieter Grudno, Beckum, and Bernhard Zigan, Diestedde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Nov. 6, 1989, Ser. No. 432,169

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839419

Int. Cl.[5] B02C *23/32*

U.S. Cl. 241—79.1 11 Claims



1. Apparatus for crushing material comprising a housing; means within said housing forming a crushing zone; material feed means having an outlet in communication with said crushing zone for delivering thereto material to be crushed; means for supplying to said feed means raw material to be crushed, said raw material initially containing relatively coarse and relatively fine particles; means for crushing the material delivered to said crushing zone; means forming an air stream for entraining fines resulting from the crushing of said material and conveying them along a path; separator means in said path for separating relatively fine fines from less fine fines; means for discharging the relatively fine fines from said housing; and at least one gas stream independent of said air stream traversing said feed means upstream from said crushing zone and in communication with said air stream for separating relatively fine particles from said raw material and delivering such separated particles to said air stream, those relatively fine particles capable of being entrained by said air stream being combined with said fines and conveyed therewith along said path.

4,982,906

MULTI-CHAMBER INCLINED BALL MILL

Hiroshi Sakamoto, Tsukuba; Mitsuru Yamamoto, Ushiku, and Hitoshi Ohya, Tsukuba, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

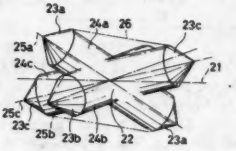
Filed Mar. 14, 1990, Ser. No. 493,336

Claims priority, application Japan, Mar. 17, 1989, 1-67226

Int. Cl.[5] B02C *17/18*

U.S. Cl. 241—179 5 Claims

1. A multi-chamber inclined ball mill comprising a grinding chamber constituted of at least three cylindrical chambers integrally formed to have their longitudinal axes intersect and to form a common grinding space in their region of intersection, a support member for supporting and driving the grinding chamber which is itself supported to rotate about an axis of rotation, the support member supporting the grinding chamber such that the longitudinal axes of the cylindrical chambers make one and the same angle with the axis of rotation, and



rotational drive means for rotatingly driving the support member.

4,982,907

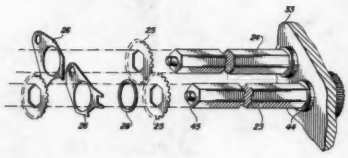
DOCUMENT SHREDDER

Brian C. Sedgwick, 4537 Katherine Ave., Sherman Oaks, Calif. 91423, and Raymond K. Mackenzie, 1031 Adelaine Ave., Sherman Oaks, Calif. 91030

Filed Apr. 28, 1988, Ser. No. 187,286

Int. Cl.[5] B02C *18/18*

U.S. Cl. 241—236 28 Claims



1. A document shredder comprising first and second cutter assemblies, each cutter assembly including

(a) a shaft mounted on a frame;

(b) cutter discs mounted on each shaft at spaced intervals, the shafts being parallel and spaced apart a distance such that the discs on the shaft of the first cutter assembly extend into spaces between the discs on the shaft of the second cutter assembly in overlapping relationship to form a nip;

(c) a drive rotating the shafts so that documents fed into the nip are cut into strips by the action of the overlapping discs; and

(d) a spacer mounted between every two immediately adjacent discs on each shaft, each spacer having a main bore in which its respective shaft is received,

only the shaft of the first cutter assembly having ring elements thereon, each ring element being of greater thickness than that of each spacer, each ring element fitting over its shaft and being located within the main bore of one of the spacer such that greater axial movement between the discs on the shaft of the second cutter assembly relative to the axial movement between the discs on the shaft of the first cutter assembly is provided.

4,982,908

METHODS AND APPARATUS FOR WINDING TWO-POLE ELECTRIC MOTOR STATORS

Sabatino Luciani, Florence, Italy, assignor to Axis S.p.A., Florence, Italy

Filed Jan. 31, 1989, Ser. No. 304,026

Claims priority, application Italy, Sep. 16, 1988, 67823 A/88

Int. Cl.[5] H02K *15/085*

U.S. Cl. 242—1.1 R 15 Claims

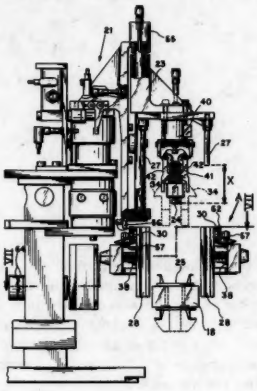
1. Apparatus for use in winding an electric motor stator of hollow, substantially cylindrical shape, said stator having a central longitudinal axis and first and second annular surfaces

substantially perpendicular to said longitudinal axis at respective opposite ends of the cylindrical shape, said apparatus comprising:

a housing for holding the stator;

first means for respectively pressing first and second winding forms against said first and second annular surfaces;

second means mounted on said housing for releasably securing said first winding form where, relative to said stator, said first means presses said first winding form against said first annular surface;



third means for releasably securing said second winding form where, relative to said stator, said first means presses said second winding form against said second annular surface; and

means for allowing said second and third means to move relative to one another substantially parallel to said longitudinal axis so that said apparatus adjusts to various stator dimensions parallel to said longitudinal axis.

4,982,909

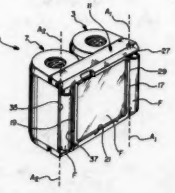
FILM CARTRIDGE AND METHOD OF ASSEMBLING THE SAME

Daniel M. Pagano, Henriette, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1990, Ser. No. 464,255

Int. Cl.[5] B65D *85/672*

U.S. Cl. 242—71.2 **5 Claims**



1. A film cartridge comprising a pair of film supply and film take-up housings having respective film passage openings, and an intermediate bridge portion along which a filmstrip may be advanced from said film supply housing to said film take-up housing, characterized in that:

said bridge portion and said film supply housing are connected at a first joint coupling for relative pivotal movement about a first pivot axis and the bridge portion and said film take-up housing are connected at a second joint coupling for relative pivotal movement about a second pivot axis; and

said bridge portion is a single piece rigid and non-folding continuously between said first and second joint couplings, and it has sufficient length to enable both of said film supply and take-up housings to be folded simultaneously against said single piece for storage purposes.

4,982,910

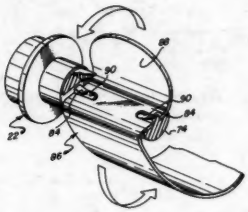
COILABLE TAPE RULE WITH IMPROVED CONNECTION BETWEEN SPRING AND HUB

Dudley V. Bickford, Chester, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Oct. 20, 1989, Ser. No. 424,383

Int. Cl.[5] B65H *75/48*; G01B *03/10*

U.S. Cl. 242—107 **7 Claims**



1. In a power returnable tape rule having a case with an exit aperture in the peripheral wall thereof, an elongated spring coiled therewith, and elongated tape rule blade coiled therewithin with its outer end extending outwardly of said exit aperture and its inner end secured to the outer end of the coiled elongated spring, and a hub with which the inner end of said spring is engaged, the improvement comprising an axially elongated transverse passage in said hub, said hub having axially extending shoulders at each axial end of said passage, and said spring having its inner end portion passing through said passage and opposed notches extending inwardly from its side margins seating said shoulders to engage said spring in said passage, said hub passage being configured and dimensioned to cooperate with said shoulders to limit movement of said spring when seated on said shoulders.

4,982,911

BELT DRIVE FOR POWER TRANSFER TO CARTRIDGE

Chester W. Newell, San Jose, Calif., assignor to Newell Research Corporation, Campbell, Calif.

Continuation of Ser. No. 424,897, Sep. 28, 1982, abandoned. This application Jul. 12, 1985, Ser. No. 754,673

Int. Cl.[5] G11B *15/26, 15/43, 23/04*

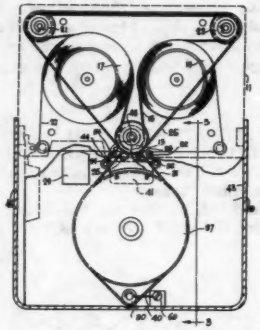
U.S. Cl. 242—192 **26 Claims**

1. For tape data cartridges of the type having a pair of tape rolls mounted in reversible tape supply and takeup relation with a tape path therebetween, a capstan and first belt guides spaced apart from the tape rolls, but disposed in said tape path, with a first belt having an inside surface trained about the first belt guides and the capstan and having an outside surface in contact with the tape for providing motive power to the tape, a drive comprising,

second belt guides spaced proximate to the capstan position and a driven power wheel independently mounted of the mounting for said cartridge tape rolls, and

a second belt having an inside surface trained about the second belt guides and the driven power wheel and having an outside surface contacting the capstan over an angular portion of the capstan surface, said second belt

frictionally engaging said capstan whereby the second belt indirectly drives the tape by transferring power through



the capstan to the first belt and may be removably brought into contact with the capstan.

4,982,912

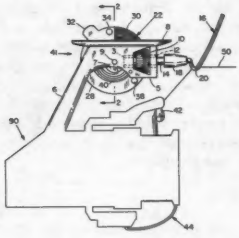
LINE CONTROL DEVICE FOR AXIAL DELIVERY REELS

Charles L. Urso, 215 Newton St., Waltham, Mass. 02154

Filed Jan. 23, 1989, Ser. No. 300,956

Int. Cl.[5] A01K *89/01, 89/015*

U.S. Cl. 242—231 **17 Claims**



1. A line control device for axial delivery reels of the type which includes a spool having a first axis normally directed in a line casting direction and a line pick-up supported to pivot about a second axis wherein the pick-up includes a line guide, the device comprising:

a mechanical finger supported to pivot about a third axis wherein the second and third axes are movable relative to each other, the finger being movable between a line engaged position and a line disengaged position, the finger being positioned to move across line extending forwardly from the guide thereby causing the finger to catch the line then the finger moves to the line engaged position;

means for moving the finger to the line engaged position including a movable grip operable by a user's digit such that the grip moves in a plane which is approximately parallel to the third axis; and

a spring connected to the finger and the spring mounted for urging the finger to move about the third axis to the line disengaged position thereby releasing the line for a cast.

4,982,913

COURSE CORRECTION UNIT

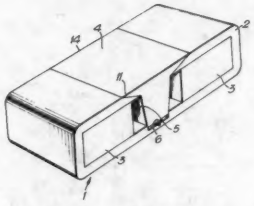
Lee Miller, Bristol, England, assignor to British Aerospace Public Limited Company, London, England

Filed Sep. 19, 1989, Ser. No. 409,561

Claims priority, application United Kingdom, Sep. 22, 1988, 8822282

Int. Cl.[5] F42B *15/18*

U.S. Cl. 244—3.22 **7 Claims**



1. A course correction unit comprising:

a chamber to be filled with propellant in use;

a valve member of non-uniform cross-section; and

releasable securing means, comprising a frangible link, for holding said valve member closed, characterised in that said securing means is configured to release the valve member at a predetermined pressure.

4,982,914

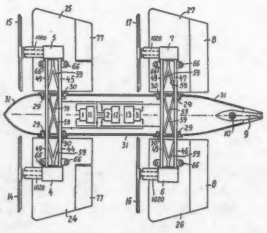
AIRCRAFT WITH A PLURALITY OF PROPELLERS, A PIPE STRUCTURE FOR THEREON HOLDABLE WINGS, FOR VERTICAL TAKE OFF AND LANDING

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 239,234, Sep. 1, 1988, and a continuation-in-part of Ser. No. 828,115, Feb. 10, 1986, Pat. No. 4,770,371, and a continuation-in-part of Ser. No. 5,065, Jan. 20, 1987, and a continuation-in-part of Ser. No. 5,535, Jan. 20, 1987, Pat. No. 4,784,351, and a continuation-in-part of Ser. No. 973,780, Dec. 27, 1978, abandoned, and a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 487,272, Jul. 10, 1974, Pat. No. 4,009,849, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, which is a continuation-in-part of Ser. No. 782,349, Dec. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,023, May 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 328,395, Dec. 5, 1963, Pat. No. 3,320,898. This application Mar. 30, 1989, Ser. No. 330,668

Int. Cl.[5] B64C *27/28*

U.S. Cl. 244—56 **4 Claims**



1. An aircraft, which comprises, in combination,

a body, at least one power plant, at least four propellers, at

least two pairs of wing portions, a transmission between said power plant and said propellers with said transmission leading equal p..tions of power from said power plant to said propellers, whereby said transmission transfers at least four portions of equal power and rate of speed individually each one to one of said propellers

to synchronize the rotary velocities of said four propellers to equal speeds and forces, arrangements to pivot the axes of said propellers and of said wing portions from vertical to horizontal and vice versa in unison and improvement,

wherein said improvement consists in the provision of a hydrostatic transmission,

wherein said power plant comprises a fluid flow producing device for the supply of four continuously one-directional individual and separate flows of pressurized fluid of equal rate of flow and pressure out of four separate fluid flow delivery outlets, one individual and separate flow out of one outlet, respectively,

wherein said propellers are driven by hydrostatic motors, each propeller individually and separate by one motor of said motors, and,

wherein 1st, 2nd, 3rd and 4th fluid lines are provided between said fluid flow producing device and said motors, which pass 1st, 2nd, 3rd and 4th flows of said flows of fluid

in said 1st fluid line from the 1st of said outlets to the first of said motors,

in said 2nd fluid line from the 2nd of said outlets to the second of said motors,

in said 3rd fluid line from the third of said outlets to the third of said motors and

in said 4th fluid line the 4th of said flows from the fourth of said outlets to the fourth of said motors to revolve said motors with equal power and rotary angular velocities to maintain equal rotary angular speeds of said propellers to maintain at all times a stabile horizontal direction of said body of said aircraft during vertical, horizontal and inclined flight in the surrounding air,

wherein said improvement provides at least two pipe structures which are pivotably borne in said body with each of said structures extending to the right and left side f said body to have on their axial ends a holding part,

wherein each of said structures comprises at least three pipes which are substantially parallel to each other with at least one of said pipes located laterally of two others of said pipes,

wherein diagonal ribs are provided between said pipes to form with said pipes a rigid pipe structure capable to carry loads in two to each other perpendicular directions,

wherein one motor of said motors is fastened to said holding means on the respective end of said pipe structure with the entrance port of said motor porting into the interior of a fluid delivery pipe of said pipes while said fluid delivery pipe is distant from said port communicated by flexible connection means to one of said outlets of said fluid flow producing device,

wherein said fluid delivery pipe of said structure passes at all times during flight of said aircraft high pressure fluid in one single flow direction to said motor to revolve the outgoing shaft of said motor while said shaft of said motor revolves one of said propellers at all times of flight of said aircraft in one rotary direction,

wherein another of said pipes of said structure passes return fluid from said motor at least indirectly back to said fluid flow producing device while the third of said pipes of said structure serves to keep said structure rigid in one of said two to each other perpendicular directions, and,

wherein said pipes of said structure are straight pipes without bends and said fluid delivery pipe is provided with an interior medial block inside of the bore of said pipe to separate the interiors of both portions axially endwards of said interior medial block and to seal them from each other, while communication ports are provided in the neighborhood of and axially endwards of said interior medial block in said delivery pipe for communication of said communication ports by individual fluid lines to individual ports of said outlets of said fluid flow producing means.

4,982,915

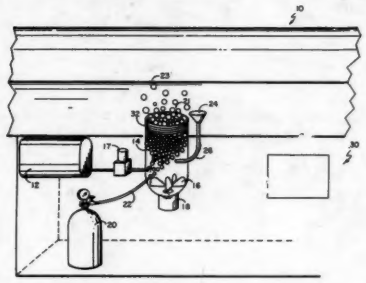
STRUCTURE AND METHOD OF PRODUCING FOAMS HAVING HYDROGEN-FILLED CELLS FOR USE IN AIRSHIP/BALLOON ENVELOPES

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed Apr. 10, 1989, Ser. No. 335,742

Int. Cl.[5] B64B *1/24*

U.S. Cl. 244—98 **3 Claims**



1. An airship/ balloon envelope structure comprising:

a mixing chamber having an open top interconnected to said airship/balloon envelope;

a mixture of an organic liquid, a surfactant and a fire retardant;

means to enter said mixture into said mixing chamber;

hydrogen gas;

means to enter said hydrogen gas into said mixing chamber; and

a blender positioned at the base of said mixing chamber adapted to foam sa1d mixture with said hydrogen gas and trap said hydrogen gas within the cells formed in the foam with said overflowing foam from the top of said mixing chamber filling said airship/balloon cnvelope with said foam mixture.

4,982,916

EJECTOR SEAT SECURITY DEVICE FOR AIRCRAFT

Hoise Dupont, Colombes, and Gerard Dupin, Clamart, both of France, assignors to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France

Filed Jun. 5, 1989, Ser. No. 361,305

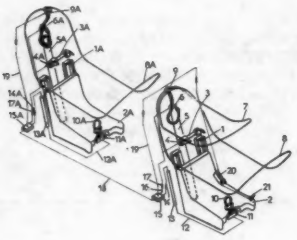
Claims priority, application France, Jun. 7, 1988, 88 07538

Int. Cl.[5] B64D *25/115*

U.S. Cl. 244—122 AF **6 Claims**

1. In an ejector seat security device for aircraft having a canopy, comprising a support structure which is adapted to be mounted in an aircraft and which can be ejected in an emergency, a seat fixedly connected to the support structure but capable of adjustment relative to the support structure, at least on pyrotechnical catapult capable of ejecting an assembly formed by the support structure, the seat and a person sitting in the seat out of the aircraft, a harness system which is capable of keeping a person in the seat and which comprises recall means to immobilise the person in a suitable position when the assembly is ejected from the aircraft, means for controlling and effecting a series of operations subsequent to ejection, a canopy-weakening device for at least weakening the canopy by a shock wave, a control handle and means connected to the handle for transforming operation of the handle into a pyrotechnical signal, and first signal transmission means for trans-

mitting this pyrotechnical signal at least to the recall means of the harness and to the catapult, the improvement wherein said



first signal transmission means comprises a detonating cord for transmitting said pyrotechnical signal as a shock wave.

4,982,917

GLIDER-CANOPY

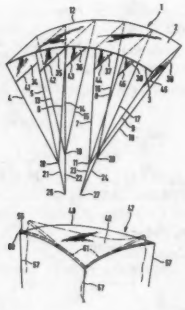
Wilhelm Graske, Tilsiter Weg 3, D-4044 Kaarst, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 302,967

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 8800987[U]

Int. Cl.[5] B64D *17/02*

U.S. Cl. 244—145 **24 Claims**



1. A glider-canopy with a wing-shaped sail having a rear edge to the underside of which are mounted downward fins essentially parallel to the intended direction of flight, shroud lines acting at least on the fins and converging by their free ends into a personnel-support, characterized in that the fins (**34** through **39**, **49** through **54**, **54**, **62**, **69**) are equipped with elastically bendable reinforcements (**41** through **46**, **61**, **64**, **71**, **72**) tensioning the fins (**34** through **39**, **49** through **54**, **62**, **69**) at least under traction from the shroud lines (**4** through **18**, **57**, **65**, **70**, **83**) during flight and essentially in the horizontal direction so that in the loaded state the sail bulges downwardly at least at said rear edge and in the event of a load decrease said reinforcements are stress relieved and the sail bulges upwardly at least at said rear edge.

4,982,918

FORCE SENSITIVE AIRCRAFT THROTTLE WITH FEEDBACK

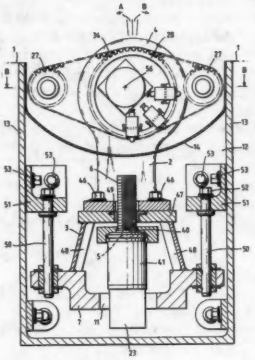
Arthur Kaye, Preston, England, assignor to British Aerospace Public Limited Company, London, England

Filed Jan. 30, 1989, Ser. No. 303,184

Claims priority, application United Kingdom, Jan. 29, 1988, 8801951

Int. Cl.[5] B64C *13/50, 13/04*

U.S. Cl. 244—223 **6 Claims**



1. Control apparatus, comprising:

a lever adapted to receive force exerted thereon without moving in response to said force,

a system of force sensors for sensing attempted movement of the lever and for generating control signals indicative thereof to control an associated apparatus or system,

a handle rotatably located at an end of the lever,

means for rotating the handle to predetermined angular positions in response to a magnitude of a demand by said received force, on the associated apparatus or system, and

means for moving said lever from an inoperable position in which the lever is stowed and said handle does not protrude from the container to an operative position in which the handle does protrude from the container.

4,982,919

REVERSING DEVICE FOR MOVABLE PARTS OF A RAILWAY SWITCH

Gerald Durchschlag, Zeltweg, and Alfred Lang, Wiesen, both of Austria, assignors to Voest-Alpine Maschinenbau Gesellschaft mbH, Linz, Austria

Filed Nov. 7, 1988, Ser. No. 267,842

Claims priority, application Austria, Nov. 5, 1987, 2931/87

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] E01B *7/00, 7/16*

U.S. Cl. 246—382 **11 Claims**

1. In a railway switch which includes a frog and two wing rails having respective end portions which are generally transversally movable into alternative longitudinally overlapping close juxtaposition with the frog for providing with the frog two alternative longitudinal railroad paths, and

a fixed base on which said frog and said two wing rails are supported,

a reversing device, comprising:

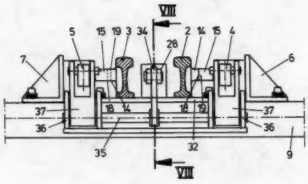
a respective supporting rod for each said wing rail end portion, each said supporting rod being supported on said fixed base and disposed generally beside the respective wing rail portion, for essentially reciprocal movement generally longitudinally of the respective wing

rail end portion between an inactive position and an active position;

means for longitudinally reciprocating each supporting rod between said inactive and active positions thereof;

each wing rail end portion and each supporting rod having mounted thereto at least one thrust support arranged to act generally transfersally of the respective said railway path, each supporting rod thrust support, upon longitudinal movement of the respective supporting rod from said inactive position thereof to said active position thereof, being arranged to engage a respective said thrust support of a respective said wing rail end portion for generally transversally shifting such wing rail end portion into longitudinally overlapping close juxtaposition with said frog;

each supporting rod thrust support and wing rail end portion thrust support which are arranged to engage one another each comprising a supporting surface which faces transversally of the respective said longitudinally railway path and extends substantially parallel



to the respective said supporting rod when such supporting rod is in said active position thereof, these supporting surfaces forming a respective pair which are engaged in surface-to-surface engagement when the respective said supporting rod is in said active position;

at least one of the supporting rod thrust support and wing rail end portion thrust support which has each said respective pair of supporting surfaces, and thus constitutes a pair of thrust supports, also having a wedge surface leading to the respective said supporting surface, each said wedge supporting surface being so oriented that, as the respective supporting rod is longitudinally moved from said inactive position thereof towards said active position thereof, as the respective said thrust supports begin to engage, each respective said wedge surface of one member of the respective pair of thrust support prior to surface-to-surface engagement being established between the respective said pair of supporting surface, whereby each said wedge surface facilitates establishment of such surface-to surface engagement.

4,982,920

PIPE CLAMP FOR CONNECTING WITH A WOODEN JOIST OR OTHER FRAME MEMBER

Charles S. Hungerford, Jr., 6 Beechwood Ct., Woodbury, Conn. 06798

Filed Jul. 7, 1986, Ser. No. 882,780
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—71 **2 Claims**

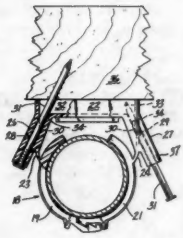
1. A clamp device for supporting a pipe or a conduit operable to make a connection with a joist or other frame member comprising:

a body including a pair of integrally formed post elements, said post elements being disposed on opposite sides of said body and each flaring outwardly and away from each other such as to form a substantially V-shaped configuration with said body;

a hinge element projecting from each of said post elements towards one another into said V-shaped configuration;

an arcuate strap member secured to each of said hinge elements such that said strap members are operable with each other to engage or release a pipe;

a first guide means defining a bore formed in the post elements for receiving and directing a fastener for connecting the clamp device to the frame member wherein the first guide means is formed with an external extension to provide hammer-head clearance thereby avoiding inad-



vertent mutilation of the adjacent hinge and strap member; and

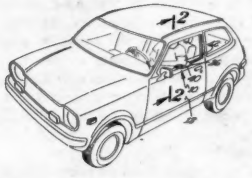
a second guide means formed by said body contiguous with said bore for further directing said fastener thereby increasing the integrity of said first guide means and insuring proper alignment of said fastener prior to driving the fastener.

4,982,921

AUTOMOBILE WINDOW ARM REST

Daniel W. Sanders, 8685 Hastings St. Northeast, Blaine, Minn. 55434

Filed Jun. 12, 1989, Ser. No. 364,862
Int. Cl.[5] B68G *5/00*
U.S. Cl. 248—118 **7 Claims**



1. An arm rest useable with a vehicle wall having a window, comprising:

an arm resting portion;

a flap portion projecting from said arm resting portion, said flap portion having a first segment and a second segment, said flap portion including:

a vehicle wall attachment portion integral with said first segment of said flap portion;

first hinge means integral with said flap portion and dividing said first segment of said flap portion from said second segment of said flap portion; and

first attachment means adjacent said first hinge means for releasably attaching said first segment of said flap portion to said second segment of said flap portion, said flap portion having a first position wherein said first attachment means is disengaged and a second position wherein said first attachment means is engaged;

second hinge means between said arm resting portion and said flap portion, whereby, with said flap portion in said first position, said arm resting portion rests against an inner vehicle wall in a storage position and, with said flap portion in said second position, said arm resting portion

rotates about said second hinge means between an arm intercept position, wherein the arm of a user may easily come into contact with said arm resting portion prior to positioning for use by the user, and a use position, wherein the arm of the user is positioned in resting contact with said arm resting portion, whereby the natural arm movement of the user to said use position will swing said arm resting portion from said arm intercept position to said use position; and

second attachment means for attaching said vehicle wall attachment portion to a vehicle wall.

4,982,922

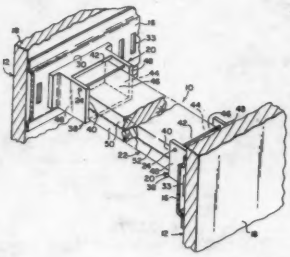
LOAD SECUREMENT ASSEMBLY

Theodore Krause, 201 Mariners Way, Copaigue, N.Y. 11726

Continuation-in-part of Ser. No. 206,817, Jun. 15, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 451,525

Int. Cl.[5] B60P *7/00*

U.S. Cl. 248—222.2 **1 Claim**



1. In combination a load securement assembly and a trailer for storing articles and having a pair of opposite side walls, said load securement assembly, comprising:

(a) a pair of tracks each containing a plurality of vertical slots and a substantially flat center, said each of said pair of tracks being affixed to the opposite side walls of the trailer, said pair of tracks being mounted directly onto the pair of opposite trailer side walls so that the pair of opposite trailer side walls do not have to be removed and replaced when mounting said pair of tracks, said pair of tracks being mountable to any type of wall whether it be solid or hollow;

(b) a pair of one piece brackets each of which is mounted onto one of said pairs of tracks, each of said brackets further including a rear wall having a plurality of resilient vertical fingers disposed thereon with each of said resilient fingers abutting both a side wall and a bracket whereby said plurality of resilient vertical fingers are sized to snugly fit into said plurality of vertical slots in said each of said pair of tracks and being held thereto, each of said plurality of said resilient fingers having a lower tab with a lower notch and an upper tab with a larger notch, said lower tab and said upper tab forming together a substantially "T"-shape so that said resilient fingers are less breakable, said each of said pair of said one piece brackets are tipped forward and inserts said upper tab into said plurality of said slots and raised up until said upper notch bottoms out at which time said lower tab is inserted into said plurality of said slots and lowered until said lower notch bottoms out so that said each of said pair of one homogeneous piece brackets are installed and removed resiliently and are further void of the need for any mechanical releases, and a box-like housing extending from said rear wall;

(c) an elongated laminated beam member having ends and longer sides extending between said pair of brackets so as to bear against the stored articles, said housing having sides a front opening and a top opening thus forming a holding area therein to receive said one end of said elongated laminated beam member; and

(d) means for keeping said elongated laminated beam member within said brackets so that said load securement assembly holds the articles in place during transportation of the trailer.

4,982,923

DEVICE FOR ADJUSTABLE MOUNTING OF GUIDE RAILS ON A BASE

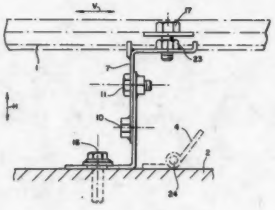
Hans Wanner, Herisau, Switzerland, assignor to Fritz Haug, AG, St. Gallen, Switzerland

Filed Aug. 17, 1989, Ser. No. 395,081

Claims priority, application Switzerland, Aug. 18, 1988, 3083/88

Int. Cl.[5] E04G *3/00*

U.S. Cl. 248—286 **6 Claims**



1. Device for the adjustable mounting of guide rails (1) on a base (2), characterized by a pedestal (3) that is fastened securely to the base (2) and has a first plate (4) with at least two receiving openings (nuts 5) at a distance (A) from each other, used to mount fastening elements (11), and which also has an arc-shaped slot (6) as well as an adjustable element (7) securely connected to a guide rail segment, with a second plate (8) containing two parallel slots (9, 9') at the same distance (A) as the receiving openings on the pedestal, as well as at least one receiving opening (nut 10) between the two, used to fasten a coupling member (11), whereby the adjustable element (7) can be secured in position on the pedestal (3) through coupling members (11) and whereby these engage in the receiving openings (screws 5 and/or 10) through parallel slots (9, 9') or a parallel slot (9) and the arc-shaped slot (6) through both parallel slots or through one parallel slot and the arc-shaped slot.

4,982,924

MOUNTING APPARATUS FOR SONAR TRANSDUCER

Felton H. Havins, Graham, Tex., assignor to Aero Marine Engineering, Inc., Bryson, Tex.

Continuation-in-part of Ser. No. 314,903, Feb. 24, 1989, Pat. No. 4,928,915, and a continuation-in-part of Ser. No. 459,597, Jan. 2, 1990. This application Feb. 20, 1990, Ser. No. 482,159

Int. Cl.[5] H04R *1/44*; B63B *17/00*

U.S. Cl. 248—288.5 **21 Claims**

1. An apparatus for mounting a sonar transducer to a boat, comprising:

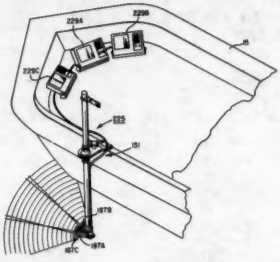
(a) an elongated first member having first and second end portions;

(b) handle means located at said first end portion of said first member, said handle means being pivotally coupled to said first member;

(c) transducer mounting means located at said second end portion of said first member, said transducer mounting means being adapted to couple to said transducer and being pivotally coupled to said first member such that said transducer can change elevational orientation with respect to a water line of said boat;

(d) an elongated second member located adjacent to said first member having first and second ends, said second member first end being coupled to said handle means and said second member second end being coupled to said transducer mounting means, wherein when said handle means is pivoted the elevational orientation of said transducer mounting means correspondingly changes;

(e) first member mounting means for mounting said first member to said boat, said first member mounting means comprising a sleeve and sleeve retaining means, said sleeve having a bore therethrough for receiving said first member, said first member being slidable with respect to



said sleeve, said sleeve having an alterable inside diameter to selectively increase and decrease diameter, wherein when said sleeve has a small inside diameter, said first member is prevented from sliding and when said sleeve has a larger inside diameter, said first member is permitted to slide with respect to said sleeve, said sleeve having means for maintaining said small inside diameter, said sleeve retaining means being adapted to couple said sleeve to said boat, said first member mounting means allowing said first member, said handle means and said transducer mounting means to turn wherein the azimuthal orientation of said transducer mounting means changes.

4,982,925

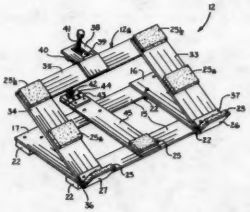
BATTERY CHARGING SUPPORT APPARATUS

Kenneth W. Hinderliter, 809 Maxwell, Wichita, Kans. 67217

Filed Nov. 20, 1989, Ser. No. 439,147

Int. Cl.[5] A47B *97/04*

U.S. Cl. 248—455 **3 Claims**



1. A battery charging support apparatus comprising in combination,

a support framework including first and second base plates of equal and finite length spaced parallel to one another with first and second end support plates integrally and orthogonally mounted to respective upper forward and rear surfaces of the first and second base plates, with resilient cushion members mounted to bottom forward and rear surfaces of the first and second base plates, and

an upper framework mounted to and extending above the support framework for support of a battery charging unit thereon, and

wherein the upper framework includes first and second plate members of equal predetermined length spaced parallel to one another with a predetermined length equal to or greater than a predetermined length defined by the first and second end support plates, and forward terminal ends of the respective first and second plate members are hingedly mounted to forward terminal ends of the first and second end support plates, and the first and second plate members include a a plurality of cushion pads mounted thereon,

and

wherein forward terminal ends of the first and second end support plates each include a leg support plate fixedly mounted at an obtuse angle to the first and second end support plates, and including a cushion pad mounted to an upper surface of the leg support members, and a third plate member integrally mounted to a bottom surface securing rear terminal end portions of the first and second plate members together, wherein the third plate member is orthogonally aligned relative to the first and second plate members, and the first, second and third plate members define the upper framework pivotally mounted to the support framework,

and

including a mounting plate integrally and orthogonally secured medially of the third plate member extending rearwardly thereof and including an elongate slot, wherein the elongate slot is orthogonally aligned relative to the third plate member, and a threaded rod extending through the elongate slot and threadedly mounted within a sliding nut member slidably mounted to a bottom surface of the mounting plate, and the threaded rod extending downwardly through the sliding nut member and pivotally secured to a foot plate, the foot plate pivotally mounted to a cross-plate, the cross-plate medially and orthogonally mounted to upper surfaces of the first and second base plates whereupon rotation of the threaded rod member pivotally adjusts the upper framework relative to the support framework.

4,982,926

RETRACTABLE MIRROR APPARATUS

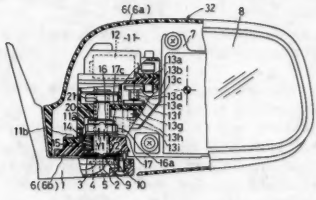
Keiji Mori, Kariya, and Hidekazu Kogita, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 12, 1989, Ser. No. 406,256

Claims priority, application Japan, Sep. 30, 1988, 63-128893[U]

Int. Cl.[5] G02B *7/18*

U.S. Cl. 248—479 **12 Claims**



1. A retractable mirror apparatus comprising:

a base;

a retraction shaft held on said base;

a mirror frame having a mirror mounting portion and engaged with said retraction shaft rotatably through a predetermined angle;

a gear held rotatably on said retraction shaft and having at

least one of engaged concave portions and engaged convex portions on an end surface thereof;

a motor for rotating said mirror frame disposed in said mirror frame; and

a claw clutch fixed on said retraction shaft and having at least one of engaging convex portions and engaging concave portions engageable and disengageable with said at least one of engaged concave portions and engaged convex portions of said gear in an area thereof facing said at least one of engaged concave portions and engaged convex portions of said gear, said concave and convex portions being formed of rigid material,

wherein disengagement of said at least one of engaging convex portions and engaging concave portions of said claw clutch and said gear, respectively, permits relative rotation of said claw clutch and said gear, together with movement of said gear relative to said claw clutch in the direction of the length of said retraction shaft,

wherein at least one of said gear and said claw clutch further comprises a cushioning member disposed in such a manner as to be elastically contactable with the other one of said gear and said claw clutch only when said at least one of said engaging convex portions and engaging concave portions of said claw clutch and said gear engage one another, whereby said cushioning member damps vibrations resulting from the engagement of said engaging convex and concave portions.

4,982,927

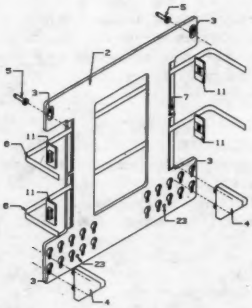
VERTICAL PRINTER STAND

Robert B. Zajeski, 25 Sunhill La., Lemont, Ill. 60439, and Donald C. Wiencek, 16529 S 84th Ave., Tinley Park, Ill. 60477

Filed Feb. 15, 1989, Ser. No. 310,612

Int. Cl.[5] A47F *7/00*

U.S. Cl. 248—674 **12 Claims**



9. A mounting means for vertically supporting a computer printer or other similar electronic office equipment comprising:

(a) two bases including two printter support mounting holes, two mounting holes capable of securing the base to a vertical structure such as a wall through the use of some standard mounting means such as a screw, planar depressions on the back of the base cpable of accepting and securing and strapping means to the base, and paper bin mounting holes near a bottom of the base;

(b) two printer supports consisting of two keyed studs capable of securing the printer supports to the base mounting holes, a top surface of the printer support being of sufficient size to support most printers, with the printer supports mounted to the base adapted to support most of the printer weight;

(c) two strap assemblies consisting of a strap constucted of sufficient length, flexibility and strength to wrap around the back of a printer and behind the strap depressions of the base; and a standard buckle allowing for adjustability and locking of the strap around the printer assembly, completing the assembly of the printer to the printer.

4,982,928

WATER OUTLET FITTING WITH SOUND DAMPER INSERT

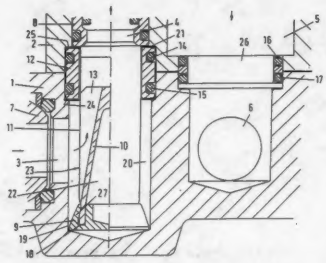
Rolf I. Avelöv, Mjölby, Sweden, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 2, 1989, Ser. No. 415,575

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 3834997

Int. Cl.[5] F16K *47/02*; F16L *55/02*

U.S. Cl. 251—118 **14 Claims**



1. A water outlet fitting, comprising a housing having at least a first housing portion and a second housing portion, the housing having wall means defining an axially elongated water outlet passage that extends from the first housing portion and into the second housing portion and a water inlet passage opening to the outlet passage at an angle, a sound damper insert in the outlet passage and having a base, a damper body connected to the base, an annular sealing element axially spaced from said base for sealing the connection between the first and second housing portions, and a connecting element substantially parallel to said damper body for connecting said base to said sealing element.

4,982,929

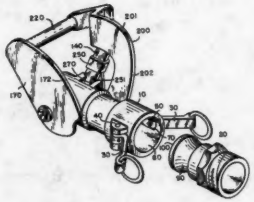
SAFETY VALVE COUPLING

Daniel P. Spurling, c/o Eastern Industrial Products, P.O. Box 1150, Pembroke, Mass. 02359

Filed Mar. 6, 1990, Ser. No. 489,046

Int. Cl.[5] F16L *37/28*

U.S. Cl. 251—149.9 **19 Claims**



1. Apparatus for preventing fluid flow upon decoupling of first and second fluid delivery tubes, wherein the first fluid delivery tube includes a reception outlet and the second fluid delivery tube includes an insertion outlet for insertion and coupling within the reception outlet, the reception outlet including a pair of arms pivotable outwardly from the reception

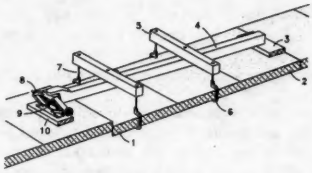
outlet for decoupling the outlets and pivotable inwardly for coupling the outlets, one of the fluid delivery tubes including a valve means for opening and closing the one tube to fluid flow, the apparatus comprising a pair of ear means mounted to the one tube including the valve means, the valve means including a handle means pivotable between valve open and valve closed positions, the ear means being pivotably mounted to the one tube including the valve means for pivotable movement between a position interfering with pivoting of the arms and a position of noninterference with pivoting of the arms, the ear means being connected to the handle means of the valve means such that when the ear means is pivoted to the position of interference the valve means is simultaneously pivoted to the open position and when the ear means is pivoted to the noninterference position the handle means is simultaneously pivoted to the closed position.

4,982,930

SIDEWALK LIFTER

John V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810

Filed Sep. 16, 1988, Ser. No. 245,230
Int. Cl.[5] B66F *3/00*
U.S. Cl. 254—124 **13 Claims**



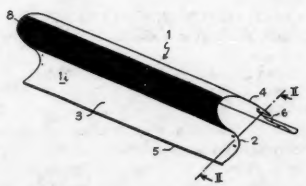
1. A device for lifting one end of a concrete slab, comprising:
a rigid main beam;
a rigid cross beam mounted on said main beam, said cross beam having a length approximately equal to the width of said slab and extending transversely to said main beam laterally on opposite sides thereof;
two hooks shaped to exert stable upward force on the underside of said slab, at positions inward of the edge of the slab, when said hooks are lifted;
flexible suspension means for connecting said hooks to said cross beam approximately above opposite edges of said slab; and jack means for lifting one end of said main beam.

4,982,931

PROCESS AND DEVICES FOR RETAINING VEHICLES ON A HIGHWAY

Claude A. Pomero, 14 Avenue du 22 Août 1944, 34500 Beziers, France

Filed May 15, 1989, Ser. No. 351,954
Claims priority, application France, May 20, 1988, 88 06907
Int. Cl.[5] A01K *3/00*
U.S. Cl. 256—13.1 **10 Claims**



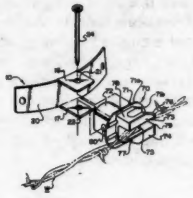
1. A safety device to be implanted along a road to retain vehicles thereon, said device comprising a surface to be exposed to the shocks of vehicles, and said surface bearing a sliding coating comprising a layer of paraffin comprising a solid alkane having a number of carbon atoms greater than 15.

4,982,932

FENCE CLIP ASSEMBLY

Wayne Baker, P.O. Box 158, Freedom, Wyo. 83120

Filed Aug. 15, 1988, Ser. No. 232,457
Int. Cl.[5] E04H *17/02*
U.S. Cl. 256—47 **1 Claim**



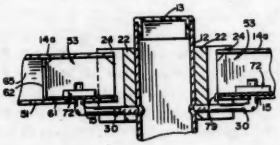
1. A fence clip assembly made of strong, durable material and having a main body with a front side, a back side, top and bottom edges and a pair of side edges with said front side extending between each of said side edges; a pair of spaced apart flat ears extending from said front side at said top and bottom edges, respectively, and including aligned holes through said flat ears; an insulator connector, providing insulation for wire, extending between said flat ears and across said front side of said main body, said insulator connector comprising a flange with front and back faces and including a boss with a hole therethrough projecting from said back face and oppositely extending fingers spaced outwardly from said front face of said flange, said fingers having tip ends respectively spaced from said flange by bridge members, said bridge members being grooved permitting a wire to extend straight across said bridge members, between said insulator flange and said fingers; and a pin having a head on one end thereof and extending through the aligned holes in said main body flat ears and the hole in the boss of said insulator connector whereby the connector is held by said clip and is secured against significant pivoting around said pin.

4,982,933

FENCE CONNECTOR CLIP AND ASSEMBLY

David H. Schultz, Grand Haven, Mich., assignor to Harbor Towne Fence, Inc., Grand Haven, Mich.

Continuation-in-part of Ser. No. 149,691, Jan. 28, 1988, Pat. No. 4,951,925. This application Aug. 19, 1988, Ser. No. 233,830
The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—65 **14 Claims**



1. A connector assembly for fencing comprising:
a generally vertical post;
a hollow, generally horizontal rail positioned adjacent said

post and having at least one wall defining an axial inner cavity, said wall further including a first elongated underside opening extending up therethrough;

a connector clip mounted within said cavity of said rail and including a second elongated opening aligned with said first opening, and a retaining structure positioned about said second opening, said retaining structure including a pair of opposed elongated flanges along opposite sides of said second opening; and

a stud attached to said post and said stud including an upwardly projecting free distal end projecting up therefrom, said free distal end being slidably received up through said first and second elongated openings at any point along their lengths and engaged by said opposed elongated flanges of said retaining structure, such that said retaining structure permits easy sliding insertion of said free distal end of said stud into said clip with lowering of said rail down onto said free distal end of said stud, but securely resists withdrawal thereof.

4,982,934

REHEATING, HOLDING AND ACCUMULATION FURNACE FOR STEELWORKS PRODUCTS

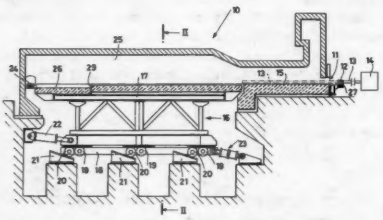
Stefano F. S. Bonino, Milan, and Nicola B. Cavero, Genoa, both of Italy, assignors to Pomini Farrell S.p.A., Castellanza and Italimpianti S.p.A., Genoa, both of, Italy

Filed Mar. 16, 1989, Ser. No. 324,515

Claims priority, application Italy, Apr. 1, 1988, 20091 A/88

Int. Cl.[5] C21D *9/00*

U.S. Cl. 266—105 **8 Claims**



1. Apparatus in a furnace for the reheating, holding or accumulation of semifinished products during passage through at least three regions of the furnace in sequence comprising in combination first means for receiving said products at the entrance of the furnace and for moving said products in a row with continuous movement through said first region of the furnace to the entrance of said second region, second means for receiving said products at said entrance to the second region and moving said products in sequence in discrete steps through said second region to the entrance of said third region, and third means for receiving said products at said entrance to the third region and for moving said products in sequence in discrete steps through said third region to the exit of the furnace and for discharging said products from said furnace; said first means when activated moving said products independently of said second and third means, said second means when activated moving said products independently of said third means, and said third means when activated moving said products simultaneously with movement of said second means.

4,982,935

MULTIPURPOSE ROD COOLING LINE

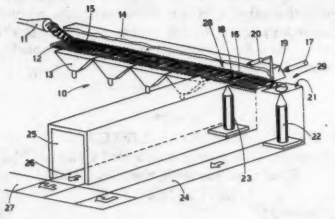
Geremia Nonini, Buttrio, and Wogler D. Ruzza, Udine, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Jan. 31, 1990, Ser. No. 472,811

Claims priority, application Italy, Feb. 13, 1989, 83325 A/89

Int. Cl.[5] B21B *43/00, 45/02;* C21D *9/52*

U.S. Cl. 266—106 **5 Claims**



1. A multipurpose cooling line for processing equally well either steel of low carbon content or steel of high carbon content, comprising:

a coil-winding means to wind steel wire rod to form steel coils;

a roller conveyor positioned downstream of said coil-winding means and having a longitudinally extending axis;

forced draft means for cooling steel coils having a high carbon content, said forced draft means being operably connected to said roller conveyor and positioned along said longitudinally extending axis thereof;

a longitudinally extending insulation hood operable between open and closed positions, said closed position being such that an axis of said longitudinally extending hood is above and parallel to said longitudinally extending axis of said roller conveyor;

a first delivery station provided under a downstream portion of said roller conveyor, said downstream portion of said roller conveyor being located under a downstream portion of said insulation hood when said insulation hood is in a closed position, said downstream portion of said roller including movable rollers operable between an open position providing access to said first delivery station and a closed position covering and closing said first delivery station;

a second delivery station provided at a terminal end of said roller conveyor downstream of said first delivery station, said terminal end being located outside of said insulation hood; and

first and second delivery pits containing first and second coil collection units, respectively, and cooperating with said first and second delivery stations, respectively.

4,982,936

CONTINUOUS ANNEALING LINES

John S. Mitchell, Burlington, Canada, assignor to Stelco, Inc., Ontario, Canada

Filed Dec. 13, 1989, Ser. No. 449,803

Int. Cl.[5] C21C *7/10*

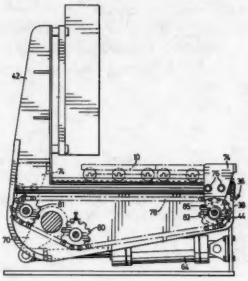
U.S. Cl. 266—249 **7 Claims**

1. A method of operating a continuous annealing furnace having an upstream and a downstream end and a single enclosure defining a plurality of longitudinally adjacent heating zones through which extend track means along which adjacent trays can pass through the furnace, the trays being adapted to support stacks of cylindrical coils of material to be annealed, the method comprising the steps:

(a) at the upstream end, loading a plurality of coil stacks,

with their axes vertical, on trays in such a way that at least one coil stack straddles at least two adjacent trays;

(b) advancing the trays through the enclosure while ensuring that the trays of at least those groupings of trays which



together support a single coil stack remain in a constant spatial relation with respect to each other; and

(c) at the downstream end, unloading the coil stacks from the trays.

4,982,937

GAS-OPERATED SPRING

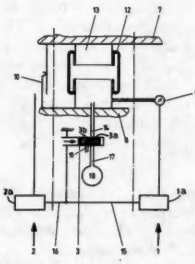
Hans-Gerd Eckel, Laudenbach, and Willi Schweikert, Heidelberg, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,146

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 3813873

Int. Cl.[5] F16M *13/00*; F16F *9/43*

U.S. Cl. 267—136 **10 Claims**



1. Apparatus for the mutual support of two oscillating elements moving relative to one another, said apparatus comprising

a gas operated spring which supports the two elements relative to each other,

valve means for admitting additional compressed gas into the gas operated spring and for releasing excess compressed gas from the spring,

means for measuring the pressure in the gas operated spring and sending a signal representing said pressure,

a first device which compensates for vibration induced pressure changes in the spring, said first device receiving said pressure signal and measuring the frequency of changes in said pressure, said first device being effective to actuate said valve means only for pressure changes of a frequency above a threshold value, and

means for measuring the relative position of the two elements and sending a signal representing said relative position,

a second device which compensates for changes in the relative position of the two elements, said second device receiving said relative position signal and measuring the frequency of changes in said relative position, said second device being effective to actuate said valve means only for changes in the relative position of a frequency below said threshold value.

4,982,938

HYDRAULIC DAMPING ELASTIC BEARING

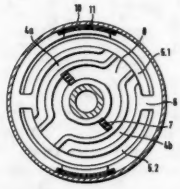
Heinrich Brenner, Ahrweiler, Fed. Rep. of Germany, assignor to Boge AG, Eitorf, Fed. Rep. of Germany

Filed Mar. 24, 1989, Ser. No. 328,466

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810310

Int. Cl.[5] F16F *9/34*

U.S. Cl. 267—140.1 **11 Claims**



1. Hydraulic damping elastomeric bearing comprising:

an internal element;

an external element disposed around said internal element to be radially spaced therefrom;

an elastomeric spring means disposed between said internal element and said external element;

said elastomeric spring means defining cavity means therein;

said elastomeric spring means providing sealing for a boundary of said cavity means;

said cavity means including at least two chambers for being filled with a damping fluid;

throttling means for throttled fluid connection of at least one of said chambers and at least another of said chambers;

said cavity means including said throttling means;

said cavity means includes additional connecting means for additional fluid connection of said at least one of said chambers and said at least another of said chambers;

said additional connecting means includes valve means; and

said valve means being an integral part of said elastomeric spring means.

4,982,939

CLAMP DEVICE FOR SHAPED BODIES

Akira Yoshikawa, Ohbu, and Tsunezo Takeuchi, Chita, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jan. 24, 1989, Ser. No. 300,893

Claims priority, application Japan, Jan. 27, 1988, 63-8066[U]

Int. Cl.[5] B25B *1/20*

U.S. Cl. 269—32 **10 Claims**

1. A workpiece clamp device for a cutting apparatus, comprising:

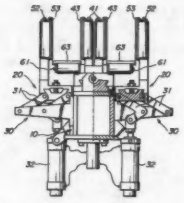
a stationary base frame;

a movable sub-frame mounted on, and adapted to be moved relative to said base frame;

a plurality of first stationary clamp members arranged on a plurality of first rotational shafts mounted on said base frame, said first stationary clamp members being adapted to swing about respective first rotational axes of said first rotational shafts which are in parallel with each other;

a plurality of second clamp members arranged on a plurality of second rotational shafts mounted on said movable sub-frame, said second clamp members being adapted to swing about respective second rotational axes of said second rotational shafts which are in parallel with each other and in parallel with said first rotational axes;

said sub-frame being movable relative to said base frame such that said second clamp members are movable toward said first clamp members to clamp a workpiece therebetween, and movable away from said first clamp members to release said workpiece; and



a plurality of stationary support members arranged on a plurality of rotational support shafts mounted on said base frame to support said workpiece thereon, said stationary support members being adapted to swing about respective third rotational axes of said rotational support shafts extending perpendicularly to said first and second rotational axes, wherein the rotational axis of each respective rotational support shaft intersects the rotational axis of each respective first rotational shaft at a point within the stationary base frame.

4,982,940

MACHINE FOR LAYING A FABRIC WEB WITH SURFACES FOR DIRECTING THE FABRIC WEB

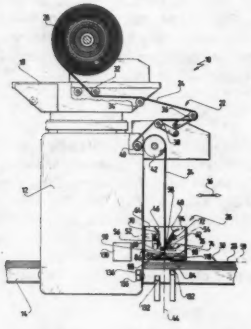
Rolf Jung, Waiblingen, Fed. Rep. of Germany, assignor to Krauss u. Reichert GmbH + Co. KG, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 351,752

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816882

Int. Cl.[5] B65H *29/46*

U.S. Cl. 270—30 **26 Claims**



1. Fabric laying machine for the zigzag laying of a fabric web comprising:

a means for guiding said fabric web having a means for delivery of said fabric web which is guided at a predetermined height above a pile of laid-out fabric layers and from which said fabric web falls freely during the laying and passes along a bend into the top fabric layer,

a cutting-off means which is associated with said means for delivery of said fabric web, and

a directing means having a surface for directing said fabric web, said surface deflecting said fabric web falling freely from said means for delivery of said fabric web and said surface being movable beneath said means for delivery of said fabric web for deflecting a freely falling end portion of said fabric web.

4,982,941

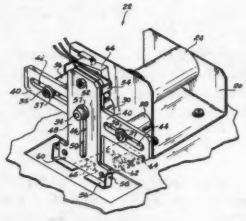
SLOTTED LINK SIDE-TO-SIDE JOGGING APPARATUS

Gregory Phillips, and Douglas Langton, both of Seattle, Wash., assignors to EMF Corporation, Redmond, Wash.

Filed Oct. 12, 1989, Ser. No. 420,566

Int. Cl.[5] B65H *29/46*

U.S. Cl. 271—84 **10 Claims**



1. A jogging apparatus for imparting a jogging motion to each of a plurality of individually fed sheets, said apparatus comprising:

(a) a motor mounted within a frame and having a rotatable motor shaft;

(b) a pin eccentrically connected to one end of said shaft;

(c) a rear link slidably connected to said frame, said eccentric pin imparting a transverse movement to said rear link;

(d) a front link slidably connected to said rear link, said eccentric pin imparting to said front link a movement orthogonal to said transverse movement; and

(e) a jogging shoe connected to said front link.

4,982,942

SHEET FEED MECHANISM

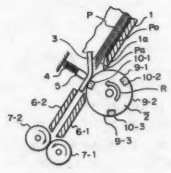
Hiroshi Konishi; Matsusaburo Noguchi; Joji Tadokoro, and Noboru Otaki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,267

Claims priority, application Japan, Jun. 8, 1988, 63-76192[U]

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—119 **3 Claims**



1. A sheet feed mechanism comprising:

a hopper loaded with a stack of sheets;

a feed roller disposed near the outlet of the hopper in contact with the sheets stacked in the hopper, said feed roller

having a central section and sheet drag sections respectively on the opposite ends of the central station,

a resilient tongue pressed against the central section of the feed roller on a sheet conveying path;

the central section of the feed roller being provided with an alternate circumferential arrangement of axial low friction portions and axial high friction portions meeting a relaxation expressed by

$$\mu_1 < \mu t < \mu_2$$

where μ_1 is the friction coefficient between the sheet and the low friction portions, μ_2 is the friction coefficient between the sheet and the high friction portions, and μt is the friction coefficient between the sheet and the tongue; and a pair of drive rollers are disposed on the sheet conveying path after the feed roller with respect to a sheet feed direction, the surface speed of the drive rollers being substantially the same as that of the feed roller.

4,982,943

ARRANGEMENT FOR PRESSING A PAPER STACK AGAINST SEPARATING ROLLERS

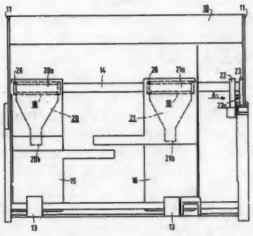
Udo Weiss, Siegen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1989, Ser. No. 314,015

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805822

Int. Cl.[5] B65H *1/26*

U.S. Cl. 271—157 **12 Claims**



1. Arrangement for pressing a paper sheet stack resting in a cassette on at least one pressure plate against at least one sheet feed roller mounted adjacent to an end of the cassette, said roller for drawing off one sheet at a time from the stack, said arrangement including a guide shaft pivotably secured to the cassette for rotation about an axis, said shaft being secured to the cassette at a region of the cassette distal said end and said at least one pressure plate pivotably secured to the cassette at one plate end for rotation relative to the cassette, the combination therewith comprising:

a leaf spring having first and second ends, the first end being secured to the guide shaft for rotation with the shaft, the second end of the spring resting resiliently against the pressure plate; and

means for releasably securing said guide shaft and said pressure plate at a plurality of angular positions about said axis.

4,982,944

TRANSPORT APPARATUS FOR TRANSPORTING CONTINUOUSLY ARRIVING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS

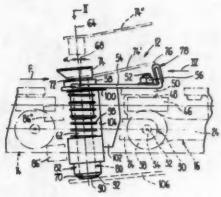
Jürg Eberle, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 19, 1988, Ser. No. 259,839

Claims priority, application Switzerland, Oct. 23, 1987, 4158/87

Int. Cl.[5] B65H *29/04*

U.S. Cl. 271—204 **10 Claims**



1. A transport apparatus for transporting continuously arriving substantially flat products, such as printed products arriving in an imbricated formation, comprising:

a revolvingly drivable traction element;

means for driving said revolvingly drivable traction element for revolving motion in a predetermined product conveying direction;

a plurality of individually controlled gripper elements arranged in mutually spaced relationship at said revolvingly drivable traction element;

each of said gripper elements comprising a clamping jaw and a clamping finger;

said clamping finger coacting with said clamping jaw of each gripper element for engaging a substantially flat product at a product edge extending transversely with respect to said predetermined product conveying direction;

a shaft member provided for the clamping finger of each gripper element;

bearing means for supporting said shaft member so as to be both independently rotatable and axially displaceable;

said clamping finger extending approximately at right angles from the shaft member of said gripper element;

means for displacing the clamping finger of each gripper element so as to rotate the same from an open position to a closed position;

said clamping finger of each gripper element being directed substantially transversely with respect to said predetermined product conveying direction when said clamping finger assumes said open position;

said clamping finger being directed in said predetermined product conveying direction when said clamping finger of each gripper element assumes said closed position;

a closing spring provided for each gripper element;

said closing spring providing a pre-biasing torsional force to said clamping finger so as to bias said clamping finger toward the open position thereof;

said closing spring of each gripper element having a predetermined compressive force which, in the closed position of the clamping finger, causes said clamping finger to be pressed against said clamping jaw with a predetermined contact force which is sufficient to prevent said pre-biasing force from moving said clamping finger toward said open position, and

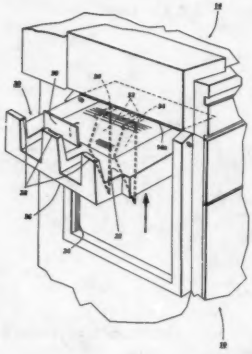
means for slightly raising said clamping finger from said clamping jaw when in said closed position so as to release said predetermined contact force and such that said pre-biasing force is then adapted to immediately move said clamping finger to said open position.

4,982,945

PLURAL MODE DOCUMENT RESTACKING TRAY FOR A COPIER DOCUMENT HANDLER

Joseph Marasco, Rochester, and Moto Sugiyama, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 6, 1989, Ser. No. 447,150
Int. Cl.[5] B65H *31/00*
U.S. Cl. 271—213 5 Claims



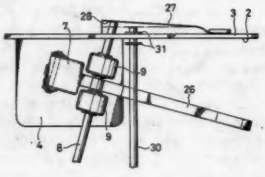
1. For a copier with a document handler ejecting from its document output, original documents being copied into a document collection tray system, the improvement comprising a plural mode document collecting system for collecting and restacking different forms of documents, including both conventional sheet documents and computer form web being re-fanfolded, with a single tray means for holding discharged documents and movable between two different operative tray mounting positions, including a first tray position of said tray means adjacent said document output of said document handler for collecting conventional sheet documents and a second tray position substantially below said first tray position for re-fanfolding computer form web; said second positions causing said tray to operate with said document output of the copier to allow for the re-fanfolding of said computer form web.

4,982,946

APPARATUS FOR TRANSPORTING PAPER

Mitsuo Uchimura; Seiji Koike; Osamu Koizumi; Takeshi Tashiro; Kazuhiro Fushimi, all of Shizuoka, and Ikuzo Sugiura, Kanagawa, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 477,479
Claims priority, application Japan, Feb. 16, 1989, 1-37043
Int. Cl.[5] B65H *9/16*
U.S. Cl. 271—251 3 Claims



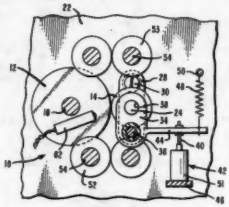
1. An apparatus for transporting paper comprising a paper transport path made up of a reference surface with which one edge portion of paper is brought into abutment and a paper guide on which the surface of the paper is supported, a skew roller supported on a roller shaft, which is arranged at an angle with the transport direction of the paper, and resiliently urged toward said paper guide, roller opening means for moving said skew roller away from said paper guide, skew roller position control means having an abutment surface with which one end portion of said roller shaft is brought into abutment when the skew roller takes a position to be in contact with the paper and a stopper edge with which the periphery of the roller shaft is brought into abutment when said skew roller takes and open position to be away from the paper and being urged toward said skew roller, and release means to move the skew roller position control means away from said skew roller.

4,982,947

APPARATUS FOR DETECTING THE PASSAGE OF MULTIPLE SUPERPOSED SHEETS ALONG A FEED PATH

Douglas L. Milne, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 8, 1988, Ser. No. 268,442
Claims priority, application United Kingdom, Mar. 30, 1988, 8807631
Int. Cl.[5] B65H *7/12*
U.S. Cl. 271—263 8 Claims



1. An apparatus for detecting the passage of superposed sheets along a feed path, comprising:

first and second cooperating rollers, with said first roller having a fixed axis of rotation;

means for feeding sheets along said feed path between said first and second cooperating rollers;

means for mounting said second cooperating roller so that its axis is movable relative to the fixed axis of said first cooperating roller and so that said second cooperating roller is biased towards said first cooperating roller to enable said second cooperating roller to be displaced away from said first cooperating roller in response to a single or multiple sheet passing between said first and second cooperating rollers;

voltage generating means associated with said second cooperating roller and arranged to produce an output voltage which varies linearly with movement of the axis of said second cooperating roller towards or away from the fixed axis of said first cooperating roller;

circuit means for storing a reference voltage representative of a minimum value of said outputvoltage during one complete revolution of one of said first and second cooperating rollers when no sheet is passing between said first and second cooperating rollers, the diameter of said one of said first and second cooperating rollers being equal to, or greater than, the diameter of the other one of said first and second cooperating rollers;

subtracting means for subtracting said reference voltage from said output voltage when a single or multiple sheet is passing between said first and second cooperating rollers so as to produce a difference value representative of the thickness of said single or multiple sheet; and

data processing means coupled to said subtracting means for providing an indication that a multiple sheet has passed between said first and second cooperating rollers if said difference value continuously exceeds a predetermined

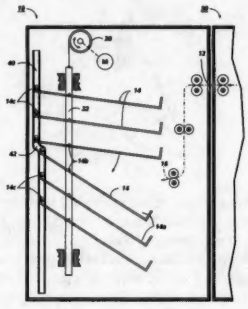
value for a period corresponding to at least a predetermined proportion of one complete revolution of said one of said first and second cooperating rollers and for providing an indication that a single sheet with a fold or adhesive tape thereof, has passed between said first and second cooperating rollers if said difference value continuously exceeds said predetermined value for a period corresponding to less than said predetermined proportion of one complete revolution of said one of said first and second cooperating rollers.

4,982,948

SORTER WITH ROCKING TRAYS

William R. Burger, and Barry P. Mandel, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1990, Ser. No. 459,857
Int. Cl.[5] B65H *39/10*
U.S. Cl. 271—293 **4 Claims**



1. In a multi-bin sorter for collating sheets of paper or the like from a fixed sheet output into sets in said bins, with a system for sorter bin loading in which the bins are opened relative to one another adjacent said fixed sheet output for their loading, the improvement wherein:

said bins are respectively intermediately pivotally mounted in an array to common mounting means with a fixed spacing at said pivotal mounting for substantially common movement as an integral unit;

drive means are driveably connected to said common mounting means for movement of said array as an integral unit in a substantially linear direction relative to said fixed sheet output;

and bin tipping means are positioned to engage and pivot an individual said bin about said intermediate pivotal mounting thereof into a sorter bin loading position opened for loading at one side of said bin relative to the next adjacent bin when said individual said bin is moved past said bin tipping means by said drive means.

4,982,949

MERRY-GO-ROUND

Calvin Ulferts, 465 Terrace Dr., Granite Falls, Minn. 56241

Filed May 10, 1989, Ser. No. 349,838
Int. Cl.[5] A63G *1/32*
U.S. Cl. 272—33 R **11 Claims**

10. A merry-go-round that can be started and propelled by children seated on the merry-go-round while other children ride the merry-go-round comprising:

a support base;

a center post extending vertically upward from said support base;

a frame, said frame rotationally mounted on said center post;

an annular shaped seating area and an annular shaped foot support located on said frame, said foot support extending below said annular shaped seating area to prevent the feet of children from getting caught on the ground or said frame as the merry-go-round spins around:

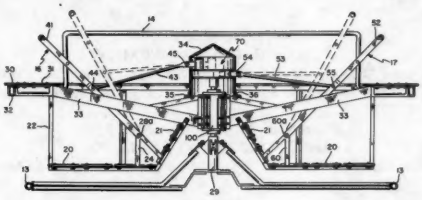
a first and a second semicircular shaped safety rails for riders on said merry-go-round to hold onto as said merry-go-round rotates about said center post;

a first plate said first plate having a center and a circumferential area, said center of said first plate connected to said center post;

a first pin connected to said circumferential area of said first plate, said first pin and said first plate forming a first crank with a dead spot;

a second plate located in a spaced parallel relationship to said first plate, said second plate having a center and a circumferential area, said first pin connecting said first plate to said second plate;

a central axis extending through said center post and said center of said first plate and said center of said second plate;



a second pin extending upward from said circumferential area of said second plate, said first pin and said second plate forming a second crank with a dead spot said first crank located above said second crank, said central axis, said first pin and said second pin positioned so as not to be in a straight line to thereby prevent said first crank from being located in said dead spot of said first crank when said second crank is located in said dead spot of said second crank;

a first handle pivotally mounted to said frame and said first crank to permit a first child on said merry-go-round to rotational propel said frame by applying a force to said first crank; and

a second handle pivotally mounted to said frame and said second crank to permit a second child on said merry-go-round to rotational propel said frame by applying a force to said second crank so that the first child and the second child can start and propel said merry-go-round with riders on said merry-go-round.

4,982,950

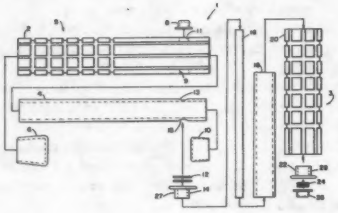
ROTATABLE EXERCISE DEVICE

Charles Petrosky, 1118 N. Jefferson St., Arlington, Va. 22205

Filed Oct. 12, 1988, Ser. No. 256,757
Int. Cl.[5] A63B *5/00*
U.S. Cl. 272—67 **3 Claims**

1. A method of exercising arms, wrist, shoulders and chest muscles comprising holding a first cushioned tubular handgrip of hand-held rotatable apparatus and rotating the handgrip either clockwise or counterclockwise to initiate circular movement of a second cushioned rotatable tubular structure in a corresponding direction and rotating of a bar passing axially through the first cushioned tubular handgrip and passing radially through the second cushioned rotatable tubular structure, rhythmically moving the hand-held apparatus and rotating the

bar in the tubular handgrip and rotating the second horizontal tubular structure by centrifugal force above an upper end of a



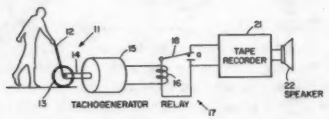
first cushioned tubular handgrip, further comprising rotating the rod within the tubular hand grip.

4,982,951

ENCOURAGING MOVEMENT

Elyena Foster, 25 Marion St., #PHI, Brookline, Mass. 02146-4904, and Yuly Pulyer, 93 Ridge Rd., Revere, Mass. 02151

Filed Mar. 25, 1987, Ser. No. 29,990
Int. Cl.[5] A63B *69/00*; G09B *19/00*
U.S. Cl. 272—70 **4 Claims**



1. Apparatus for encouraging walking comprising:

vehicle means for supporting a person and assisting said person in walking,

said vehicle means having push bar means for engagement by said person for receiving a force from said person causing movement of said vehicle means and also having a source of a stored audible message encouraging said person hearing the message to walk and move the vehicle means,

transducing means for reproducing the stored audible message,

means responsive to movement of said vehicle means for providing a movement signal,

and means responsive to said movement signal for providing said stored audible message to said transducing means only while said vehicle means is moving.

4,982,952

SIMULATED CLIMBING EXERCISE DEVICE

Shui-Mu Wang, No. 25, Huan-Kung Rd., Yung-Kang Hsiang, Taiwan

Filed Apr. 25, 1990, Ser. No. 514,130
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—70 **5 Claims**

1. An exercise device, comprising:

a base;

an elongated prop extending upward from said base and having an upper and a lower longitudinal slide groove;

a first left and a first right slide piece movably disposed on opposite sides of said elongated prop in said upper slide groove, each of said first left and said first right slide pieces having a handle piece;

a second left and a second right slide piece movably disposed on opposite sides of said elongated prop at said lower slide groove, each of said second left and second right slide pieces having a foot support piece;

a left vertical adjoining plate connecting said first and said second left slide pieces;

a right vertical adjoining plate connecting said first and said second right slide pieces;

means for alternatingly moving said left and said right vertical adjoining plates downward and upward, said alternating movement means being provided adjacent to a top end of said elongated prop and connected to said left and said right vertical adjoining plates; and

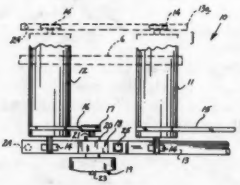
hydraulic cylinder resistance means for providing a resisting force against any movement of said left and said right vertical adjoining plates, said hydraulic cylinder resistance means being mounted to said base and connected to said second left and said second right slide pieces.

4,982,953

EXERCISE APPARATUS

Todd K. Makishi, 16405 S. Gramercy Pl., Gardena, Calif. 90247

Filed Mar. 26, 1990, Ser. No. 500,533
Int. Cl.[5] A63B *69/16*
U.S. Cl. 272—73 **5 Claims**



1. An exercise apparatus for support of a bicycle thereon comprising, in combination,

a framework including a right and a left spaced parallel rail arranged in alignment relative to one another including a forward support roller and a rear support roller for support of a rear wheel of the bicycle thereon, the forward and rear support rollers orthogonally and rotatably mounted to the right and left rails, and

an adapter member including a forward and rear planar surface mounted on one of said rails, the forward and rear planar surfaces arranged in longitudinal alignment with side surfaces of the one of said rails, wherein the adapter member is mounted between said forward and rear rollers, and

a support shaft rotatably mounted within said adapter member and further including a pulley mounted to the support

shaft adjacent the rear planar surface of the adapter member, and

a magnetic resistance means mounted to the adapter shaft adjacent the forward planar surface of the adapter member for providing resistance to rotation of the support shaft within the adapter member during rotation thereof said resistance is adjusted by rotation of said resistance means on said shaft.

4,982,954

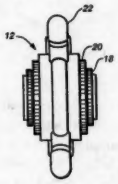
EXERCISE DEVICE OF SKILL AND AMUSEMENT

Janos Lazar, 1752 Milton St., Redwood City, Calif. 94063

Filed Mar. 31, 1989, Ser. No. 331,412

Int. Cl.[5] A63B *21/22*

U.S. Cl. 272—93 **14 Claims**



1. An exercise device of skill and amusement, comprising:

(a) generator means including stator means, rotor means and electric output means;

(b) means for supporting said generator means for movement along a predetermined path such that movement of said generator means along said path automatically causes at least one of said stator means and said rotor means to rotate relative to the other, whereby to generate electric power at said output means; and

(c) electrically powered action means supported by said support means and electrically connected with the output means of said generator means for receiving power from said generator means whereby a centrifugal force is imparted to said generator means as the latter moves around said path, whereby an individual can manipulate said support means to cause said generator means to move along said path and thereby energize said action means.

4,982,955

EXERCISE DEVICE

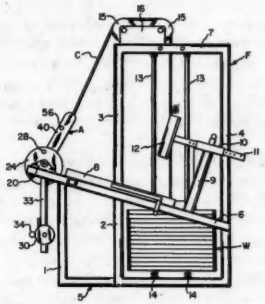
Heasley, Raymond E., 38 Silver La., McKees Rocks, Pa. 15136

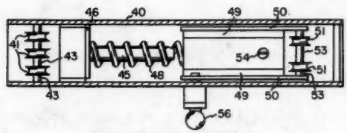
Filed Feb. 21, 1989, Ser. No. 313,589

Int. Cl.[5] A63B *21/062*

U.S. Cl. 272—118 **6 Claims**

1. An exercise device including a frame, a seat mounted on said frame, a weight stack having a plurality of movable weights, an elongated resistance convertor arm in the form of a hollow tubular member having a first end and a second end, means rotatably mounting said first end of said resistance convertor arm on said frame, cable means having a first end connected to weights in said weight stack and a second end connected to said second end of said resistance convertor arm, said resistance convertor arm including take up means located within said tubular member to constantly maintain said cable in a substantially taut condition between said second end of said resistance convertor arm and said weight stack regardless of the distance between said weight stack and said second end of said resistance convertor arm, a movable contact member adapted to be moved by a user of the exercise device, means for rotatably mounting said contact member on said frame and adjustment means for operatively connecting said contact member and said resistance convertor arm, said take up means including first pulley means adjacent to said first end of said tubular member and second pulley means adjacent to said second end of said tubular member, said second pulley means being mounted on adjustment means for varying the location of said second pulley means along the length of said tubular member, whereby the relative angular position of said second end of said resistance convertor arm and the horizontal plane including said contact member can be varied to change the





pattern of the resistance to movement of said contact member, the second pulley means being adapted to be moved longitudinally along said resistance convertor arm according to the position of said resistance convertor arm relative to the plane including said contact member.

4,982,956

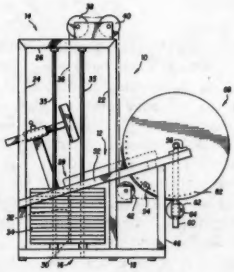
VARIABLE RESISTANCE EXERCISE APPARATUS

Thomas G. Lapcevic, 1411 Grandview Ave., Apt. 808, Pittsburgh, Pa. 15211

Filed Apr. 3, 1989, Ser. No. 332,836

Int. Cl.[5] A63B *21/062*

U.S. Cl. 272—118 **20 Claims**



1. Weight lifting exercise apparatus comprising:

a. a support frame;

b. weight support carriage means vertically moveable within said support frame for detachably securing a plurality of weight members;

c. cable guide means supported by said support frame;

d. a cable segment secured at one end to said weight support carriage means and extending through said cable guide means;

e. a horizontal shaft rotatably supported on said frame;

f. a bearing member attached to said shaft for engagement by a user to rotate said shaft;

g. a cable wheel mounted on said shaft for rotation therewith, said cable being attached at its other end to a point on said cable wheel, said cable wheel having an arcuate cable receiving surface onto which said cable segment may be wound by the rotation of said shaft by a user rotating said bearing member, with a point of tangency being defined where said cable separates from said cable receiving surface to thereby define a radius of tangency; and

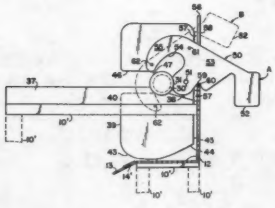
h. a supplemental cam member having a supplemental cable receiving surface, said cam member being attachable to said cable wheel so that said supplemental cable receiving surface may overlie at least a portion of said cable receiving surface to define a modified cable receiving surface which presents radii of tangency during rotation of said cable wheel which are greater than the radii of tangency presented by said cable receiving surface.

4,982,957

ALIGNMENT APPARATUS FOR USE IN FREEWEIGHT BARBELL SYSTEMS

William D. Shields, 3031 Dalehurst Dr. West, Jacksonville, Fla. 32211

Filed Sep. 5, 1989, Ser. No. 402,865
Int. Cl.[5] A63B *21/075*
U.S. Cl. 272—123 **22 Claims**



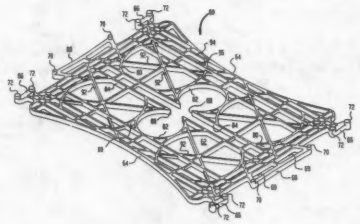
1. In a barbell weight lifting apparatus including a frame comprising an elongated lifting bar having opposite end portions, a plurality of planar weights adapted to be selectively attached to said bar, selective means on each said weight for detachably securing said weights to said bar, each said weight having an identically positioned horizontally disposed lateral slot therein extending from a generally upright edge of said weight to generally medially thereof, said bar being positionable through each said slot at respective said weights, selective said weights being directly connected to and supported by said bar, support means for movably positioning and storing said weights upstanding in a horizontal row including a pair of spaced weight receiving trays each having an upper surface and being affixed to said frame adjacent respective end portions of said bar, the improvement comprising alignment means attached to each said tray to align the weights thereon, said alignment means including a plurality of upright spacing members spaced along and affixed to said upper surface of said tray for aligning said weights horizontally when said weights are stored on said tray.

4,982,958

EXERCISE BOARD

Myron Ullman, Youngstown, Ohio, assignor to Boardman Molded Products, Inc., Youngstown, Ohio

Filed Oct. 10, 1989, Ser. No. 419,796
Int. Cl.[5] A63B *21/04, 21/055*
U.S. Cl. 272—138 **10 Claims**



1. In an exercising device comprising a footboard having longitudinally opposed ends each including band holding means to releasably retain elastic bands, and support means for supporting an upper surface of said footboard in space relation from a floor, and a set of continuous elastic bands for use in exercising and adapted to have portions thereof positionally received by said band holding means and having portions distal from the received portions of the elastic bands adapted to be positionally received about a user's body to facilitate said exercising, said support means supporting said upper surface of said footboard sufficiently above the floor relative to said band holding means to prevent the received portions of the elastic bands from coming into engagement with the floor, the improvement wherein

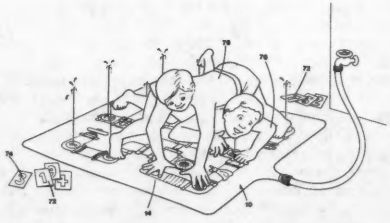
said footboard comprises an integrally molded unitary element having a vaulted and ribbed undersurface, ribs of said undersurface comprising said support means, said ribs having sidewalls and being present in a pattern so as to define at least one cavity on the underside of said footboard which cavity is sized so that at least two of said sidewalls of said ribs frictionally retain a stored accessory therebetween.

4,982,959

WATER SPRINKLER MAT GAME

Elliot Rudell, 6556 Sattes Dr., Rancho Palos Verdes, Calif. 90274, and George Foster, Signal Hill, Calif., assignors to Elliot Rudell, Torrance, Calif.

Filed Sep. 11, 1989, Ser. No. 406,419
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—1 GE **9 Claims**



1. A game mat comprising:

a. a flat sheet providing a playing surface;

b. a plurality of position-indicating indicia located at preselected positions about the upper surface of said flat sheet;

c. an enclosed body immediately beneath said flat sheet containing a fluid distributor comprising a plurality of interconnected fluid flow passageways extending longitudinally and laterally coextensive with the length and width of said flat sheet;

d. an inlet port to said enclosed body with attachment means to attach a source of water under pressure to said inlet port; and

e. a plurality of apertures extending through said flat sheet and opening into said fluid distributor of said body, said apertures being of small diameter, sufficient to form a discharge spray of liquid upon the application of a liquid under pressure to said inlet port.

4,982,960

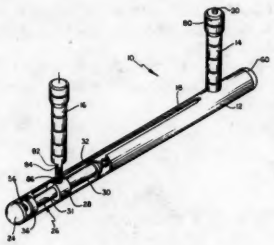
TWO-HANDLE BATON

Robert David, 6769 Vickiview Dr., Westhills, Calif. 91307

Filed Feb. 27, 1989, Ser. No. 316,097

Int. Cl.[5] F41B *15/02*

U.S. Cl. 273—84 R **8 Claims**



1. A baton for self-protection and police work, comprising:

a cylindrical shaft having a longitudinal slot therein;

a first handle firmly mounted upon said cylindrical shaft for gripping by a user's hand extending from one side of said cylindrical shaft at an angle thereto;

a second handle slidably mounted without said slot in said cylindrical shaft for gripping by a user's hand extending from the same one side of said cylindrical shaft as said first handle, at an angle to said shaft and parallel to said first handle; and

a spring for urging said second handle slidably away from said first handle.

4,982,961

GAME WITH SPINNING TOPS

Takahiko Ichimura, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,919

Claims priority, application Japan, Aug. 24, 1988, 63-110864

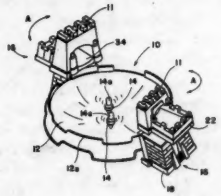
Int. Cl.[5] A63B *67/14*; A63H *1/06*

U.S. Cl. 273—109 **17 Claims**

1. A game for spinning tops comprising:

a stage having an upper surface; and

first means disposed at a perimeter of the upper surface of the stage for launching a spinning top in a desired direction onto the stage,



wherein the first launching means includes a stationary base detachably coupled to the stage and having an upper end, and a guide pivotally coupled to the upper end of the base.

4,982,962

BRIDGE BOARD FOR OUTDOOR USE

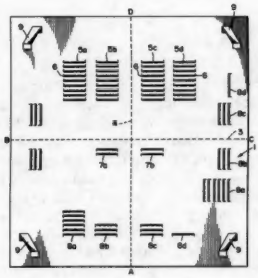
Ehab Fawzy, 22 Chippewa Avenue, Nepean, Ontario, Canada (K2G 1X7)

Filed Jun. 20, 1989, Ser. No. 369,012

Claims priority, application Canada, Jul. 26, 1988, 573059

Int. Cl.[5] A63F *1/10*

U.S. Cl. 273—148 A **6 Claims**



1. A Bridge board for outdoor use, comprising a stiff board having a playing surface that can be placed between opposing pairs of players seated around the board and participating in a game of Bridge such that the players can place their playing cards on said playing surface during the game, said playing surface having at a first player station a first array of pockets designed to retain a respective dummy's playing in exposed overlapping relationship such that dummy's playing cards are visible to the players seated around the board, said pockets of said first array being defined by four columns of at least nine parallel slits in said playing surface, a second array of pockets in the middle of the playing surface for retaining the playing cards of each trick as it is played such that the playing cards thereof are visible to each player, said pockets of said second array being defined by four slits in said playing surface, third and fourth similar arrays of pockets at adjacent second and third player stations for accommodating, in overlapping relationship, tricks taken by each pair of players, one of said second and third player stations being located immediately adjacent said first player station, said pockets of said third and fourth arrays being defined by a plurality of columns of parallel slits in said playing surface, at least one of said columns of said plurality consisting of six slits, and the total number of slits in each of said third and fourth arrays being thirteen, said pockets of said third and fourth arrays thereby permitting the tricks taken by the opposing pairs of players to be separately

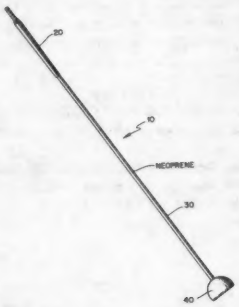
retained such the number of contract tricks taken by each pair can be easily determined at any point in the game, and a bracket member on said playing surface to one side of each player station for retaining a pack of playing cards not in use during a game, whereby the Bridge game can be played outdoors in the presence of wind.

4,982,963

GOLF CLUB SWING TRAINING DEVICE

Jerry J. Fazio, Williamsburg; E. Wayne Jackson, III, Zanoni, both of Va., and David E. Legere, West Palm Beach, Fla., assignors to Swing Maker, Incorporated, Williamsburg, Va.

Filed Feb. 17, 1989, Ser. No. 311,973
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 A **1 Claim**



1. A golf swing training apparatus comprising a club member, said member including:

an elongate shaft member which is substantially uncrimpable, and lengthwise substantially inextensible and laterally curvable to provide significantly more flexibility than a regulation golf club shaft, but less flexibility than exhibited by completely flexible materials such as rope, which may be severely bent or crimped:

a head member attached to one end of said shaft member said head member being made of resilient material which reduces the risk of property damage or personal injury during a training session; and

a grip member attached to the other end of said elongate shaft member, means for adjustably positioning and holding said grip member at different locations lengthwise on said shaft member between said grip member and said head member to effectively provide different shaft lengths corresponding to those found in conventional sets of numbered woods and irons.

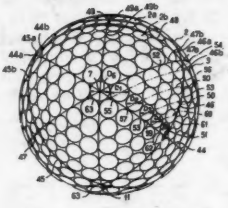
4,982,964

GOLF BALL

Joseph Morell, Annecy, France, assignor to Salomon S.A., Annecy, France

Filed Nov. 28, 1989, Ser. No. 442,214
Claims priority, application France, Nov. 29, 1988, 88 15569
Int. Cl.[5] A63B *37/12, 37/14*
U.S. Cl. 273—232 **10 Claims**

1. A golf ball comprising a peripheral surface having the general shape of a sphere and a plurality of dimples arranged in the said peripheral surface, said dimples defining intersection circles where they intersect with said peripheral surface, said intersection circles being distributed on said peripheral surface in accordance with a repetitive motif determined by subdivision of said peripheral surface along 6 equatorial circles of which each is centered on an axis passing through respective midpoints of two diametrically opposed edges of a cube inscribed in said sphere, in a manner to define 24 elemental surfaces in the form of a spherical isosceles right-angle triangle, inside which said intersection circles are essentially distributed, at least a determined one of said equatorial circles cutting none of said intersection circles and subdividing each of the others of said equatorial circles into two equatorial circular arcs, of



which each corresponds to one of two hemispheres defined by said determined equatorial circle, said equatorial circular arcs mutually cutting in pairs or threes at determined points of intersection on each said hemisphere, wherein at least one intersection circle is arranged about a respective one of said points of intersection of three of said equatorial circular arcs.

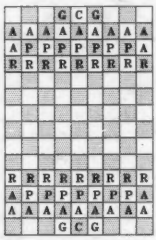
4,982,965

STRATEGIC MILITARY TYPE BOARD GAME

Wolodymyr Y. Dozorsky, 3355 Via Lido #365, Newport Beach, Calif. 92663

Filed Jan. 2, 1990, Ser. No. 459,988
Int. Cl.[5] A63F *3/02*
U.S. Cl. 273—262 **2 Claims**

The arrangement of both sets on the battlefield before a game begins.



A ambient
C capital
G general
P patrol
R regular

1. A method of playing a game comprising the steps of:

providing a rectangular game board of 126 checkered squares,

14 squares in length and 9 squares in width; providing each player with a set of 30 black pieces or 30 white pieces, each of the two sets consisting of different pieces including one capital piece, two general pieces, eleven ambient pieces, seven patrol pieces, and nine regular pieces;

positioning said game board such that the width of the board faces each player;

positioning the pieces at the outset of the game by placing the capital piece on the central square of the end row of 9 squares, placing the two general pieces on the two squares adjacent to the capital in the same row of 9 squares, placing nine ambient pieces on the 9 squares of the first row in front of the capital, placing the remaining two ambient pieces on the 2 end squares of the second row in front of

the capital, placing the seven patrol pieces on the remaining squares of the second row of 9 squares in front of the capital, and placing the nine regular pieces on the third row of 9 squares in front of the capital;

designating a different movement capability to each of said different pieces;

each player taking turns moving said pieces in single moves; optionally capturing opposing pieces by moving a piece to a square occupied by an opposing piece;

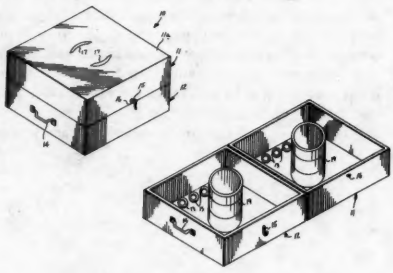
winning the game by capturing the opposing capital, or else ending the game in a draw, a surrender, or a forfeiture.

4,982,966

RING TOSS GAME APPARATUS

William J. Teafatiller, 11315 N.W. 36th Ave., Vancouver, Wash. 98685

Filed Jul. 18, 1989, Ser. No. 381,462
Int. Cl.[5] A63B *67/06*
U.S. Cl. 273—338 **5 Claims**



1. A ring toss game apparatus comprising, in combination,

a first receptacle case and a second receptacle case, wherein each of the first and second receptacle cases are of equal cross-sectional configuration, and

the first receptacle case including a first planar end wall and the second receptacle case including a second planar end wall, and

first side walls extending in a surrounding relationship about the first end wall, and second side walls extending in a surrounding relationship about the second end wall, and

plural securement means cooperatively mounted to the first and second side walls for selective securement of the first case and the second case together, and

first securement apertures formed in the first end wall, and second securement apertures formed in the second end wall, and

a first target means for securement to the first securement apertures, and a second target member for securement to the second securement apertures, and

a first and second plurality of planar ring washers associated with each of said respective first and second cases for being tossed at an opposing second and first target means respectively by an individual, and

including a handle mounted to a side wall of the first receptacle case, and

wherein the first securement apertures comprise diametrically opposed and concentrically oriented arcuate slots positioned medially of the first end wall, and the second apertures comprise diametrically opposed and concentrically oriented arcuate slots formed medially of the second end wall, and

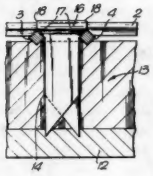
wherein each first and second target member includes a hollow cylindrical member including arcuate projections of a predetermined cross-sectional configuration equal to a further cross-sectional configuration defined by each of the first and second arcuate slots, and the arcuate projections are integrally formed to a respective end of each of the cylindrical target members.

4,982,967

DARTBOARDS

Malcolm Kicks, Haverhill, England, assignor to Larrett Tungsten Dart Company LTD, Haverhill, England

Continuation of Ser. No. 72,763, Jul. 13, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,676
Claims priority, application United Kingdom, Jul. 14, 1986, 8617096; Jan. 23, 1987, 8701476
Int. Cl.[5] F41J *3/00*
U.S. Cl. 273—408 **4 Claims**



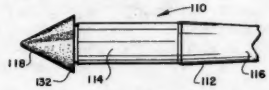
2. A compressed sisal fiber dartboard including a plurality of radially-extending members and a plurality of circularly-extending members constituting bed-defining members, the said members being arranged on a surface of the dartboard, the radially-extending members defining sector-shaped playing areas and overlying the circularly-extending members, and the circularly-extending members being arranged in pairs, each pair of circularly-extending members defining a respective standard annular playing ring, and associated with the radially-extending members flat fastening means in the form of staples having leg portions which extend into the dartboard, which enable a smooth face to be presented by the radially-extending members when the surface of the board is viewed and which hold the radially-extending members to the dartboard, each of the staples having a saddle portion which straddles the associated radially extending member and engages the associated circularly-extending members and being positioned on the dartboard in a said ring between a respective pair of circularly-extending members with its width parallel to the length of its associated radially-extending member, coacting surfaces on each of the radially-extending members and each of the staples maintaining the associated pair of circularly-extending members defining a ring in fixed spaced relation against the dartboard surface.

4,982,968

GAME DART

Charles F. Foley, Charlotte, N.C., assignor to Innoland, Inc., Pineville, N.C.

Filed Feb. 2, 1989, Ser. No. 305,519
Int. Cl.[5] A63B *65/02*
U.S. Cl. 273—420 **10 Claims**



1. A game dart of the type adapted for use with a dart board having plural projecting dart-receiving fingers, said dart comprising an elongate body, a plurality of guide flights at one end of said body, and a compressibly resilient tip at the opposite end of said body, said body having a tip mounting recess formed in said opposite end of said body and said tip having a mounting portion compression fitted into said recess, said tip being substantially conical to minimize any possibility of directly aligned impact with the fingers of the dart board, said tip having a base portion generally completely covering said

opposite end of said body for frictional engagement of said base portion with the dart-receiving fingers of the dart board and being conically tapered from said base portion at a conical tape angle with respect to the elongate extent of said body of less than about forty-five degrees (45°), said tip being of predetermined durometer scale hardness of between aprroximately fifity (50) and eighty (80) to provide sufficient relative softness to compress upon impact with a person's body or with interior building walls, furniture and other common household articles to minimize any possibility of injury or damage thereto upon accidental impact thereof and to resist tendency to rebound upon impact with the dart board to optimize retention of said tip by the fingers of the dart board, said body having a rigid barrel at its said opposite end, said barrel having a leading end portion adjacent said tip and said tip having a base portion of a larger transverse dimension than said barrel for fully covering said leading end of said barrel and for frictional engagement of said base portion of said tip with the dart-receiving fingers of the dart board.

4,982,969

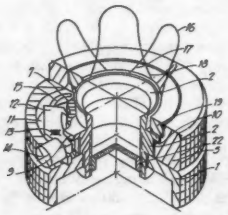
DEVICE FOR FIXING A DONOR'S EYEBALL

Svyatoslav N. Fedorov, ulitsa Dostoevskogo, 12, kv. 32; Leonid F. Linnik, ulitsa Deguninskaya, 17, kv. 36; Natalya I. Sukhareva, ulitsa 800-letia Moskvy, 5, korpus 3, kv. 127, and Igor I. Korotkov, ulitsa Ierusalimskaya, 9, kv. 9, all of Moscow, U.S.S.R.

Filed Dec. 1, 1988, Ser. No. 278,835

Int. Cl.[5] A61F *9/00*

U.S. Cl. 279—1 R **6 Claims**



1. A device for fixing a donor's eyeball, comprising:

a body having an inner portion and an outer portion;

the inner portion of said body fitted coaxially in the outer portion of said body, rotatable with respect to said outer portion and having means to retain the inner portion in a present position in relation to the outer portion;

retainers comprising a number of arcuate elements, secured symmetrically with one of their ends on said inner portion of said body, and with the other end secured on said outer portion of said body whereby upon relative rotation of the outer portion in relation to the inner portion, the ends of the arcuate elements are moved apart so that the arcuate elements interact with the donor's eyeball.

4,982,970

CLAW UNIT WITH PAIRED SEPARABLY CONNECTED CLAW ELEMENTS

Atsushi Otani, Abiko; Hidefumi Shirotori, Abikoshi; Nobuyuki Morikawa, Nara, and Shunsuke Otani, Kasiwara, all of Japan, assignors to Hitachi Seiki Co., Ltd., Abiko, Japan

Filed Jul. 14, 1988, Ser. No. 218,856

Claims priority, application Japan, Aug. 19, 1987, 62-126142[U]

Int. Cl.[5] B23B *31/16*

U.S. Cl. 279—123 **1 Claim**

1. A chuck comprising:

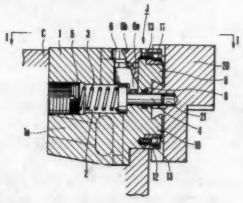
a chuck body having a central axis and mounted on a rotatable main shaft of a machine tool;

a master jaw mounted to said chuck body so as to be movable radially relative to said central axis of said chuck body, said master jaw having a front face and a rear face, a dove-tail shaped receiving portion defined in said front face, said receiving portion including first and second planar inclined surface extending in a direction substantially transverse to said radial direction of movement of said master jaw;

a top jaw detachably mounted to said master jaw, said top jaw having a rear face and a front face, said rear face including at least one engaging portion having an inclined surface for engaging one of said inclined surfaces of said receiving portion so that said engaging portion of said top jaw can be engaged with said receiving portion of said master jaw by inserting said engaging portion of said top jaw into said receiving portion of said master jaw and, subsequently, moving said top jaw in said radial direction;

recess means defined on one of said master jaw and said top jaw for cooperating with protrusion means defined on the other of said master jaw and said top jaw to limit movement of said top jaw relative to said master jaw in a direction transverse to said radial direction while allowing relative movement in said radial direction when said top jaw is engaged with said master jaw;

means for locking said top jaw to said master jaw when said



top jaw is disposed in a predetermined position relative to said master jaw, said means for locking including a locking element slidably mounted to said master jaw so as to be movable in a direction parallel to said axial direction of said main shaft, means for resiliently urging said locking element towards said top jaw, and a bore defined is said top jaw for receiving said locking member to thereby prevent relative movement of said top jaw and said master jaw in said radial direction and in a direction transverse to said radial direction;

an engaging member having first and second longitudinal ends and a longitudinal axis which extends in a direction substantially perpendicular to said direction of movement of said locking element, a cam engagement element defined at said first end of said engaging member, said cam engagement element being in engagement with said locking element, said second end of said engaging member being exposed to the exterior of said master jaw, said second end of said engaging member having a groove which is engageable so as to rotate said engaging member about said longitudinal axis thereof from the exterior of said master jaw; and

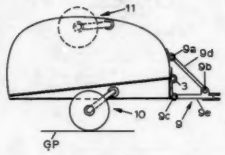
means for selectively varying an urging force of said urging means to thereby vary a force urging said locking member in a direction toward said top jaw, said means for selectively varying an urging force being movable in a direction substantially parallel to said axial direction of said main shaft.

4,982,971

VEHICLE ENCLOSURE

Randy L. Marin, 413 Lady of the Lake Rd., St. Martinville, La. 70582

Continuation of Ser. No. 367,985, Jun. 19, 1989, abandoned.
This application May 2, 1990, Ser. No. 518,079
Int. Cl.[5] B60F *5/00*
U.S. Cl. 280—30 **7 Claims**



1. An improved portable vehicle enclosure comprising a base and a pivotally attached cooperating cover, said cover arranged to cooperate with said base to form a confining plano-concave enclosure, said pivoting cover to move relative to said base to permit entry and exit of a vehicle, the improvement comprising;

said base having a first end and a second end separated by a longitudinal distance, an upper surface and a lower surface separated by an increasing vertical distance from said first end to said second end;

said cover having an inner concave surface bounded by a rim shaped to generally engage the perimeter of said upper surface;

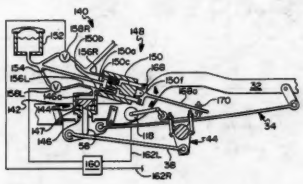
hinge means arranged for attachment to said cover and to said base such that a portion of said rim and said upper surface at said second end are pivotally associated such that said cover can be pivotally rotated about said hinge to admit entry of a vehicle at said first end, wherein said enclosure is adapted to function as a trailer comprising: means to attach at least one axle and wheel assembly to each side of said base providing at least two axle and wheel assemblies; and hitch means attached by a first end to said second end of said base and arranged to a distal end for attachment to a vehicle for towing; and wherein said hitch means comprises an upper member and a lower member hingedly connected near said distal end, said upper member hingedly connected to said cover and said lower member hingedly connected to said base.

4,982,972

HYDRAULIC PUMP AND ACTUATOR FOR PARALLEL AUXILIARY LEAF SPRING

David M. Preston, Drayton Plains; Erlen B. Walton, Farmington Hills; James L. Oliver, Pontiac, and James A. Juriga, Bloomfield Hills, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 26, 1989, Ser. No. 457,025
Int. Cl.[5] B60G *17/00*
U.S. Cl. 280—121 **33 Claims**



1. A vehicle comprising left and right ground engaging wheel mechanisms rotatably mounted on opposite ends of an axle assembly extending transverse to a longitudinal axis of a vehicle chassis assembly having front and rear ends; main spring means vertically supporting the chassis assembly on the axle assembly; first and second transversely spaced apart and generally longitudinally extending auxiliary leaf springs each having a first end attached to one of the assemblies and a second end disposed for reacting against the other assembly, the auxiliary leaf springs for vertically supporting the chassis on the axle assembly in parallel with the main spring means; and an actuator means affixed to one of the assemblies and selectively operative to position a reaction means between the one assembly and a portion intermediate the ends of each auxiliary leaf spring for varying the amount of vertical support provided by the auxiliary leaf springs; characterized by:

the actuator means including first and second relatively movable means respectively affixed to the chassis and the reaction means, and operative to move the reaction means into contact with the auxiliary leaf spring portion in response to pressurized hydraulic fluid in a variable volume chamber defined by the first and second means; and

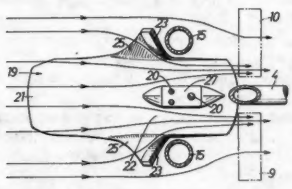
a pump including a housing affixed to the chassis, the housing including an inlet connected to a source of unpressurized hydraulic fluid, an outlet connected to the variable volume chamber via passage means, and fluid displacement means therein driven by a drive means connected to the axle assembly and operative to pump fluid from the inlet to the outlet for supplying the pressurized hydraulic fluid to the variable volume chamber in response to jounce of the axle assembly.

4,982,973

FRONT FENDER FOR FRONT-FORKED VEHICLES

Kazuhiko Saito, Tokyo; Kazuhiko Yokoyama, and Yoshihiro Kimura, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 783,447, Oct. 3, 1985, abandoned. This application Jan. 24, 1990, Ser. No. 469,716
Claims priority, application Japan, Nov. 8, 1984, 59-235694
Int. Cl.[5] B60K *11/06*
U.S. Cl. 280—152.1 **9 Claims**



1. A front fender for a vehicle having a centrally located engine and a fork having a pair of exposed, mutually spaced fork elements located forwardly of said engine, comprising:

a fender body having an upper surface, said fender body extending across substantially the entire width of said fork with said upper surface defining an air passage between said fork elements, said air passage having an air inlet portion defined by a substantially horizontal projection extending laterally outwardly from each side of said fender body, each horizontal projection being located in front of a respective one of said fork elements, and a guide wall rising substantially vertically from a rearward edge of each said projection, each said guide wall being located in front of the forwardly exposed portion of a respective one of said fork elements and extending rearwardly and inwardly across substantially the entire width of said fork elements to guide air toward the engine from in front of the fork; and

said fender body having an upper surface with a raised portion located between said guide walls, said raised por-

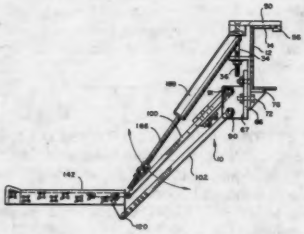
tion extending vertically from said upper surface and longitudinally of said air passage so as to regulate air flow toward said engine.

4,982,974

ADJUSTABLE HIGH VEHICLE BOARDING STEP

Warren L. Guidry, Rayne, La., assignor to Interco Tire Corporation, Rayne, La.

Filed Feb. 3, 1989, Ser. No. 305,627
Int. Cl.[5] B60R *3/02*
U.S. Cl. 280—164.2 26 Claims



1. An adjustable boarding step for high-clearance vehicles comprising:

(a) adjustable clamp means for clamping onto a supporting structure of a vehicle;

(b) a bracket interconnecting said clamp means and at least an upper and a lower support member;

(c) said support members each having at least a proximate and a distal end;

(d) means for adjustably connecting said support members to said bracket at said proximate end by a first pivot means, each of said support members being rotatable about said first pivot means;

(e) a step assembly including a second pivot means for adjustably and pivotally connecting said step assembly to said support member distal end, whereby said first and second pivot means maintain said support members in a generally parallel relationship to each other;

(f) biasing means for maintaining the step assembly at a predetermined position, said biasing means having at least two ends, one end being pivotally connected to said clamp means and the other end being pivotally and longitudinally adjustably connected to at least one of said support members; and

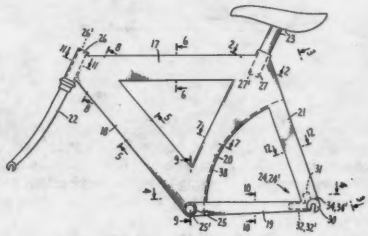
(g) means for adjusting effective length of said support members comprising for said upper support member a plate disposed adjacent to said upper support member and slidable connected thereto, with said plate being connected to said first pivot means, a connecting member, fixedly connecting said plate member at predetermined locations to effect a desired length adjustment in said upper support member, and for said lower support member a series of transverse bores adapted to cooperating with said second pivot means.

4,982,975

COMPOSITE BICYCLE FRAME WITH PRESSURE MOLDED JUNCTURE

Brent J. Trimble, 265 Westridge Dr., Watsonville, Calif. 95076

Division of Ser. No. 53,370, May 12, 1987, Pat. No. 4,850,607, which is a continuation-in-part of Ser. No. 861,983, May 12, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 337,816
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] B62K *19/16*
U.S. Cl. 280—281.1 22 Claims



1. A cycle frame connecting at least two support means of the group comprising a steering support means for supporting a fork assembly, a seat support means for supporting a seat assembly, a pedal support means for supporting a pedal assembly, and a wheel support means for supporting a wheel assembly; said cycle frame being characterized in that:

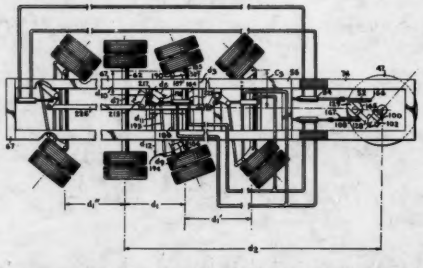
a generally hollow unitary frame component extends longitudinally between and connects said at least two support means and comprises at least two adjacent wall sections each comprising at least one molded layer of fibrous material impregnated with a synthetic resin, said adjacent wall sections being integrally united by at least one pressure molded juncture to provide a unitary wall of said resin impregnated fibrous material around an interior cavity of said unitary frame component, said at least one pressure molded juncture comprising overlapping layers of said resin impregnated fibrous material provided by overlapped parts of said adjacent wall sections.

4,982,976

METHOD AND APPARATUS FOR STEERING MULTIPLE AXLE TRAILERS

David A. Kramer, Independence, Mo., assignor to Trailer Design and Engineering, Inc., North Kansas City, Mo.

Filed Dec. 14, 1988, Ser. No. 284,291
Int. Cl.[5] B62D *13/04*
U.S. Cl. 280—426 9 Claims



1. A sectored radian steering mechanism for a steerable trailer assembly on a towing vehicle having a fifth wheel, said

trailer including an elongated main frame with a gooseneck portion, said gooseneck portion being pivotally connected to the fifth wheel; said fifth wheel being in load supporting relation to said gooseneck portion; said main frame being supported by at least one steerable fixed axle with pairs of ground engaging wheels pivotal about wheel kingpins, a steering arm associated with each axle for receiving a steering output signal from said sectored radian steering mechanism, and stay rods connected to and forcibly steering said pairs of wheels in unison, said steering mechanism including:

(a) rotational motion detection means adapted to sense the relative rotation between the towing vehicle and the steerable trailer and generate a rotational output signal proportional to an angle between said towing vehicle and said steerable trailer; said rotational output signal approaching an asymptote as the angle between the towing vehicle and the steerable trailer approaches 90 degrees first and second members associated with said motion detection means; said first and second members adapted to rotate with the towing vehicle; said second member adjusting connected at a first end to said first member; a second end of said second member generating said rotational output signal; said asymptote being adjustable by varying a distance between said first and second members;

(b) motion transformation means associated with said rotational motion detection means and adapted to transform said rotational output signal into a linear motion output signal;

(c) linear motion transfer means associated with said motion transformation means and adapted to transmit linear motion output signal to said steerable axle; and

(d) steering actuation linkage means connected to said linear motion transfer means and adapted to transform said linear motion output into rotational motion in each fixed steerable axle.

4,982,977

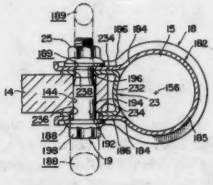
CAMBER SETTING APPARATUS OF A STRUT TYPE SUSPENSION

Hideo Shimada, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,394

Int. Cl.[5] B62D *17/00*

U.S. Cl. 280—661 **8 Claims**



1. A camber setting apparatus of a strut type suspension of a vehicle, wherein a relative angle of a steering knuckle is adjusted to set a camber angle, a strut having a lower end portion and an axis, and the steering knuckle having an upper portion, the improvement which comprises:

a bracket secured to the lower end portion of the strut and connecting the upper end portion of the steering knuckle to the lower end portion of the strut, the bracket including a pair of parallel flanges projecting outwards from the strut, one of the flanges including a first guide for defining a first guide opening extending crosswisely with respect to the axis of the strut and the other flange having a second guide for defining a second guide opening extending in parallel with the axis of the strut;

relative angle adjusting means for adjusting the relative angle of the steering knuckle to the strut, the adjusting means including an adjust bolt having a larger diameter portion and a smaller diameter portion, the larger diameter portion being larger in diameter than the smaller diameter portion and being eccentric to the smaller diameter portion, the larger diameter portion slidably passing through the first guide opening and closely passing through the upper portion of the steering knuckle, the upper portion being placed between the flanges, and the smaller diameter portion slidably passing through the second guide opening; and

pivoting means passing through the flanges and the upper portion of the steering knuckle for pivotally fastening the steering knuckle to the flanges, the pivoting means being vertically spaced from the adjusting means, whereby the upper portion of the steering knuckle is swung about an axis of the pivoting means by turning the adjust bolt to adjust the relative angle of the steering knuckle to set the camber angle.

4,982,978

REAR SUSPENSION SYSTEM

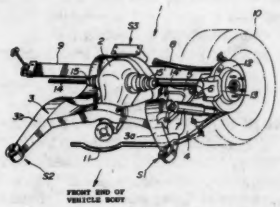
Akira Kawasaki, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 10, 1989, Ser. No. 377,447

Claims priority, application Japan, Jul. 11, 1988, 63-173126; Jul. 11, 1988, 63-173127

Int. Cl.[5] B60G *7/00*

U.S. Cl. 280—675 **12 Claims**



1. A rear suspension system comprising:

an A-shaped control arm for supporting a rear wheel at a first point;

a lateral rod supporting the rear wheel at a second point and supported on a vehicle body at a third point;

said control arm and said lateral rod being constructed and arranged so that said second point is located more laterally outward of the vehicle body than said first point and that said second point is located more forward of the vehicle body than said third point.

4,982,979

ACTIVE SUSPENSION SYSTEM WITH ENHANCED RESPONSE CHARACTERISTICS HYDRAULIC CIRCUIT

Yohsuke Akatsu; Naoto Fukushima; Yukio Fukunaga; Itaru Fujimura; Masaharu Satoh; Kensuke Fukuyama; Kenro Takahashi, and Masahiro Tsukamoto, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 26, 1989, Ser. No. 454,785

Claims priority, application Japan, Dec. 26, 1988, 62-328499; Aug. 31, 1989, 1-225578

Int. Cl.[5] B60G *17/00*

U.S. Cl. 280—707 **19 Claims**

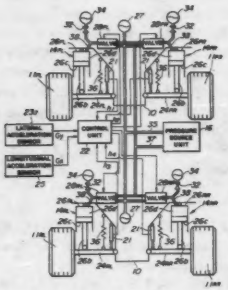
1. An actively controlled suspension system comprising:

a hydraulic cylinder disposed between a vehicle body and a suspension member rotatably supporting a vehicular wheel, said hydraulic cylinder defining therein a working chamber;

a pressure source means including a pump means associated

with an automotive internal combustion engine to be driven by the output of said engine;

a pressure control valve means having a first port connected to said working chamber, a second port connected to said pressure source means via a supply line and a third port connected to said pressure source means via a drain line,



said pressure control valve means being variable of valve position for selectively establishing and blocking fluid communication between said first port and said second port and between said first port and said third port for adjusting fluid pressure in said working chamber for controlling suspension characteristics; and

means for absorbing back pressure in said drain line.

4,982,981

MECHANISM FOR SEAT BELT WITH A MANUALLY ADJUSTABLE POSITION

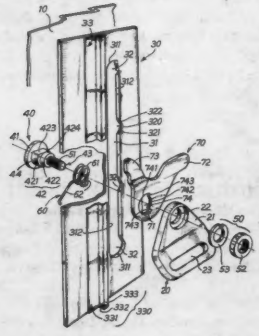
Francois Fourrey, Montbeliard; Serge Deley, Seloncourt, and Gerard Escaravage, Valentigney, all of France, assignors to Ecia-Equipements et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Nov. 3, 1989, Ser. No. 431,330

Claims priority, application France, Nov. 4, 1988, 88 14459

Int. Cl.[5] B60R *22/20*

U.S. Cl. 280—801 **16 Claims**



1. A seat belt holding mechanism comprising,

an elongate body having therein an elongate slot having in one side thereof a plurality of longitudinally spaced indents,

a stud comprising a head, two successive cylindrical bosses of different diameter and an end portion, the boss of larger diameter being adjacent said head, having a flat side and being slidably received in said slot in said body,

biasing means acting on said stud with a torque to rotate it relative to said body,

a support on said body located close to said slot,

a manoeuvring lever rotatable on said boss of larger diameter of said stud through a limited angle and comprising an operating handle and a stop cooperating with said support to limit rotation of said manoeuvring lever relative to said body,

a seat belt strap support rotatable on said boss of smaller diameter of said stud and having a slot for receiving said seat belt, and means on said end portion of said stud for retaining said manoeuvring lever and said seat belt strap support on said stud,

said stud being movable longitudinally of said slot from one of said indents to another by manual manipulation of said manoeuvring lever.

4,982,982

ASSISTANT APPARATUS FOR FASTENING A WEBBING

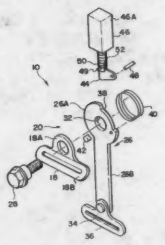
Yuji Nishimura, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan

Filed Mar. 12, 1990, Ser. No. 492,065

Claims priority, application Japan, Mar. 13, 1989, 1-28364[U]

Int. Cl.[5] B60R *22/00, 22/18*

U.S. Cl. 280—808 **17 Claims**



1. An assistant apparatus for fastening a webbing, which is adapted to move an intermediate portion of a webbing in the front direction of a vehicle for aiding an occupant sitting on a seat of the vehicle in fastening the webbing around the occupant, comprising:

a reach arm portion which is pivoted on an upper portion of a pillar of the vehicle and which has a free end portion on which an intermediate portion of the webbing is supported;

a return spring which urges said reach arm portion in a direction in which the free end portion of said reach arm portion is moved to the front side of the vehicle;

a cam which is engaged with said reach arm portion when the free end portion of said reach arm portion is moved in the rear direction of the vehicle against the urging force of said return spring, and which thereby prevents said reach arm portion from being swung in the front direction of the vehicle under the influence of the urging force of said return spring; and

a solenoid which, when electrically energized, releases said reach arm portion-from the engagement between said reach arm portion and said cam.

4,982,983

PERFECTED INJECTOR SUPPLY FITTING

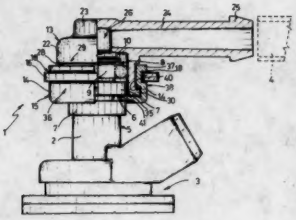
Gianluigi Lenzi, and Paolo Bortolotti, both of Bologna, Italy, assignors to Weber S.r.l., Turin, Italy

Continuation of Ser. No. 290,155, Dec. 27, 1988, abandoned. This application Apr. 13, 1990, Ser. No. 511,984

Claims priority, application Italy, Dec. 24, 1987, 68127 A/87

Int. Cl.[5] F16L *27/00*

U.S. Cl. 285—281 **7 Claims**



1. In combination with a fuel supply tube and a fuel injector having a union including an axial shoulder, a fitting for connecting said fuel supply tube to said fuel injector, the improvement comprising:

a hydraulic connecting cap fitted onto said union, said cap having a connection tube removably connected to said fuel supply tube, said cap having an outer cylindrical surface including an axial groove defined towards said union by a raised annular edge;

a sealing ring interposed between said cap and said union providing a fluid-tight relationship therebetween; and

means for mechanically connecting said cap to said union such that said cap rotatably engages said union, said means for connecting including a pair of coaxially-mating half rings assembled partly on said union and partly on said cap, each said half ring including a bottom wall having a shape of a semi-circular ring, each said bottom wall having an internally facing edge engaging said axial shoulder of said union, each said half ring further including a lateral wall perpendicular to said bottom wall, each said lateral wall having a first semitoroidal C-section portion defining an external semiannular groove and internally engaging said annular groove of said cap, each said lateral wall having a second semitoroidal C-section portion oppositely oriented to said first semitoroidal C-section portion and having an internal semiannular groove engaged by said raised annular edge of said cap, said bottom walls axially securing said union and said cap in rotatable engagement, and elastic means externally engaging each said external semiannular groove to removably connect said half rings together.

4,982,984

ACTIVE DOOR LATCH ASSEMBLY

Chitoshi Yokota, Saitama; Minoru Kawano, Miyazaki; Masahiko Sueyoshi, Miyazaki; Toshiro Nishida, Miyazaki; Shohachi Setoguchi, Miyazaki, and Akira Fujimoto, Miyazaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 281,199

Claims priority, application Japan, Dec. 7, 1987, 62-309262; Dec. 7, 1987, 62-309263; Dec. 7, 1987, 62-309264; Dec. 7, 1987, 62-309265; Dec. 7, 1987, 62-186134[U]; Dec. 7, 1987, 62-186135[U]

Int. Cl.[5] E05B *47/00*

U.S. Cl. 292—201 **9 Claims**

1. An active door latch assembly, comprising:

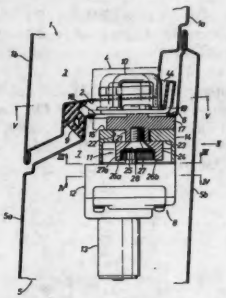
a striker mounted on a vehicle body so as to be moveable inwardly toward and outwardly away from said vehicle body by a certain stroke;

a latch mechanism mounted on a closure member such as a door for latching said striker thereto upon closing of said closure member against said vehicle body;

electrically powered drive means for moving said striker toward and away from said vehicle body;

detecting means provided separately from said latch mechanism for directly detecting a latched and unlatched state of said latch mechanism; and

control means for activating said electrically powered drive means so as to move said striker away from said vehicle



body when said detecting means has detected the unlatching of said latch mechanism and towards said vehicle body when said detecting means has detected the latching of said latch mechanism;

wherein said latch mechanism includes a movable latch member which can move between a latch position to engage said striker and an unlatched position to disengage said striker, and a pawl member which engages said latch member at said latched position; and said detecting means comprises a limit switch which is activated by said pawl member as the latter moves to a position activated by said pawl member as the latter moves to a position to engage said latch member at said latched position.

4,982,985

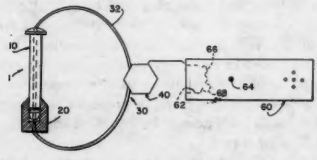
BOLT TYPE SEAL WITH FIBER OPTIC SEAL

Richard I. Atlas, Newark, N.J., assignor to E.J. Brooks Company, Newark, N.J.

Filed Mar. 6, 1989, Ser. No. 319,336

Int. Cl.[5] E05B *41/00, 39/02*

U.S. Cl. 292—327 **13 Claims**



1. A bolt type seal having an elongated metal bolt with a formed head at one end and a separate locking mechanism attached to the other end, an axial hole extending through the bolt and head and an aligned axial hole extending through the locking mechanism and a fiber optic bundle extending through the aligned holes and extending outward from the head and outward from the locking mechanism, end portions of the fiber optic bundle being mounted in a locking block and ends of the fibers in the bundles being exposed in surfaces of the block,

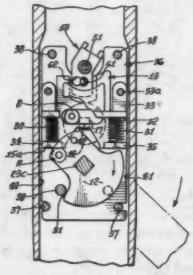
whereby the security of the bolt type seal and any tampering therewith may be observed by observing ends of the fibers in the fiber locking block.

4,982,986

LEVER/KNOB ACTUATED ENTRY MECHANISM

Charles A. Gressett, Jr., Eagle Rock, and Gregg L. Smith, Long Beach, both of Calif., assignors to Adams Rite Manufacturing Company, City of Industry, Calif.

Continuation-in-part of Ser. No. 382,414, Jul. 20, 1989, which is a continuation-in-part of Ser. No. 286,178, Dec. 19, 1988, Pat. No. 4,915,432. This application Dec. 1, 1989, Ser. No. 444,412
Int. Cl.[5] E05C 1/16
U.S. Cl. 292—336.3 19 Claims



1. In apparatus for transferring door opening or closing motion, in response to operation of a double handle, the combination comprising:

(a) a mounting means,

(b) first, second and third elements carried by the mounting means, for movement relative thereto, the first and second elements coupled to the second element, the second element carried by said mounting means for bodily movement in response to movement of the first element by the door handle, the third element being rotatable in response to bodily movement of the second element,

(c) a rotary output element connected to the third element,

(d) the second and third elements having alternative coupling positions characterized in that in one position the output element is rotated clockwise when the handle is operated, and in the other position the output element is rotated clockwise when the handle is operated,

(e) the second element being in the form of a slider coupled to be displaced linearly by the first element when the handle is operated,

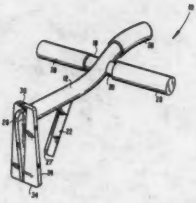
(f) and wherein the first and second elements have primary cam and cam follower surfaces, and the second and third elements having secondary cam and cam follower surfaces, the primary cam follower surface having C and D sections and the secondary cam surface having E and F sections, the primary cam engaging the C section and the secondary cam follower engaging the E section when the handle is to be rotated clockwise, and the primary cam engaging the D section and the secondary cam follower engaging the F section when the handle is to be rotated counterclockwise.

4,982,987

MASONRY BLOCK TOOL

Clifford H. Riggins, 700 W. 60th St., Anderson, Ind. 46013, and Terry L. Riggins, 2811 S. Rangeline Rd., Anderson, Ind. 46017

Filed Jun. 27, 1989, Ser. No. 372,262
Int. Cl.[5] B65G 7/12
U.S. Cl. 294—62 10 Claims



1. A masonry block tool for picking up, transporting and laying webbed masonry blocks, comprising:

a main handle member with a first end and a second end;

a pair of aligned cross handle members integral with said main handle member and disposed at right angles thereto at a location along said main handle member closer to said first end than to said second end;

a downwardly projecting and forward angling tongue member integral with said main handle member at a point closer to said second end than to said first end of said main handle member and disposed such that said tongue member lies in a plane perpendicular to the center line of said cross handle members; and

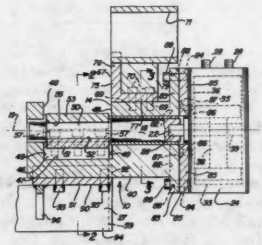
a downwardly projecting end blade member with a top end and a bottom end, said end blade member being integral with said second end of said main handle member at said top end of said end blade member and disposed such that said end blade member and said main handle member are at right angles at said second end and such that said end blade member is disposed in a plane lying perpendicular to the plane in which said tongue member lies.

4,982,988

SIDE PANEL CLAMP MECHANISM

Patrick M. Murphy, Lake Orion, Mich., assignor to Mif-Sud Industries, Inc., Sterling Heights, Mich.

Filed Oct. 19, 1988, Ser. No. 259,917
Int. Cl.[5] B66C 1/22
U.S. Cl. 294—81.61 28 Claims



1. A gripper mechanism adapted to tightly grip the edge areas of a sheet metal plate so that the plate can be lifted from a horizontal position and manipulated into different positions, said gripper mechanism comprising:

a carrier body having a motor attachment face disposed at one end thereof;

a shaft rotatably extending through said carrier body normal to said motor attachment face, said shaft having a non-circular drive in proximity to said motor attachment face;

a motor mountable on said motor attachment face of said carrier body, said motor having an extending rotary output member directly connected to said non-circular drive of said shaft, whereby motor rotation causes said shaft to rotate about an axis of rotation;

a stationary clamp structure attached to said carrier body engageable with an upper face of said sheet metal plate to be lifted; and

a lifter arm structure attached to said shaft and rotatable therewith in a plane normal to said axis of rotation to engage an undersurface of said sheet metal plate and clamp said sheet metal plate between said lifter arm structure and said stationary clamp structure.

4,982,989

AUXILIARY HANDLE

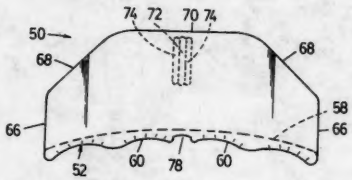
Henry D. Sweeny, Kitchener, Canada, assignor to Swenco Limited, Ontario, Canada

Continuation-in-part of Ser. No. 368,796, Jun. 20, 1989, Pat. No. 4,932,702. This application Mar. 27, 1990, Ser. No. 499,818

Claims priority, application Canada, May 4, 1989, 598728

Int. Cl.[5] A45C *13/26;* **B65D** *33/06*

U.S. Cl. 294—171 **5 Claims**



1. An auxiliary handle for use with a container having its own handle portion comprising: narrow base means having a longitudinally generally downwardly concave outer surface, a longitudinally generally arcuate inner surface generally parallel to said outer surface, and a plurality of longitudinally adjacent and concave transversely extending finger-receiving recesses in said outer surface; a pair of planar side wall means converging upwardly away from said base means and having upper free edges, with said base means inner surface being located between said wall means; a first narrow rib extending from an inner surface of one wall means towards the other wall means; a pair of second narrow ribs extending from an inner surface of said other wall means towards said one wall means, each of said ribs being elongated in the direction of convergence of said wall means; and a portion of said first rib being interleaved with a portion of said second ribs; whereby said auxiliary handle can be engaged with a container handle portion by spreading said wall means to separate said first rib from said second ribs, passing such handle portion past the separated ribs, and bringing such handle portion into contact with said inner surface, a person then being able to better support the container and a load therein by gripping the auxiliary handle rather than the container handle portion itself, the interleaved ribs preventing inadvertent release of the auxiliary handle from the container handle portion.

4,982,990

RAIL WHEEL

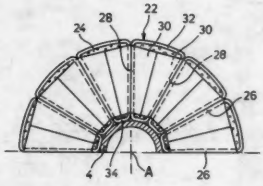
Bernd Bongers, Kirchheim; René Meurer, Munich; Walter Oefner, Otterfing; Klaus Rode, Disenhofen, and Georg Maier, Isen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,703

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814343

Int. Cl.[5] B60B *17/00, 5/02*

U.S. Cl. 295—21 **14 Claims**



1. In a rail wheel including a wheel hub, a wheel tire and a wheel disk, which wheel disk rigidly joins the wheel hub and the wheel tire and comprises a fibrous composite type of construction including two external fibrous composite surface layers and a relatively light inner core which transmits sheering force, arranged between said surface layers, an improvement wherein the inner core comprises sheer resistant fibrous composite profile sections having a longitudinal direction, each of said profile sections extending radially between the wheel hub and the wheel tire and including web portions disposed perpendicularly to the surface layers and profile side walls formed in one piece on longitudinal edges of the web portions with a continuous fibrous structure, the profile side walls being coupled with the surface layers to transmit forces, the profile sections having an intersecting fibrous orientation, slanted at an angle to the longitudinal direction of the sections.

4,982,991

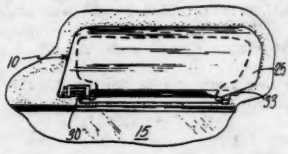
UPHOLSTERED SUN VISOR

Abdi R. Lawassani, Pontiac, and Mark J. Wasik, Alma, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jun. 29, 1989, Ser. No. 373,858

Int. Cl.[5] B60J *3/00*

U.S. Cl. 296—97.1 **15 Claims**



1. An upholstered sun visor characterized by:

a substantially rigid, generally planar core having two opposed major surfaces bounded by an edge portion;

an envelope, said envelope comprising a pair of generally parallel panels, each having inner and outer surfaces and being bounded by and edge portion, said core being received within said envelope such that said inner panel surfaces are in surface-to-surface contact with said major surfaces of said core; and

upholstery material, said upholstery material covering said outer surfaces of said envelope panels and including a skirt

folded over the edge portions of said envelope panels and disposed between said inner surfaces thereof

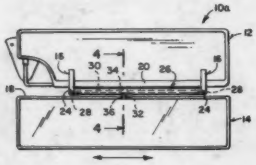
said planar core, envelope and upholstery material being fixed together for maintaining the structural integrity of said sun visor.

4,982,992

CLIP ON FLAT SUN VISOR

Thuan D. Vu, 323 18th St., Brooklyn, N.Y. 11215, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Feb. 17, 1989, Ser. No. 311,970
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.6 1 Claim



1. A clip on glare shield for a sun visor in a motor vehicle comprising:

(a) a flat generally rectangular tinted transparent guard member for intercepting glaring light rays;

(b) means for clipping said guard member onto said sun visor;

(c) means for rotating said guard member on said clipping means into an up stored position and a down intercepting position, wherein said clipping means includes a pair of alligator clips which are spaced apart along one side edge of said guard member; wherein said rotating means furthur includes:

(d) an elongated rod having a pivot pin portion formed at each end thereof and a track therein, in which each said pivot pin portion extends through one side of one of said alligator clips and

(e) a bracket having a head thereon which rotates and slides within the track and a leg that extends transversely from said rod into a center of the side edge of said guard member so that said guard member can pivot up and down, rotate and slide with respect to the sun visor for additional adjustment thereto for intercepting the glaring light rays.

4,982,993

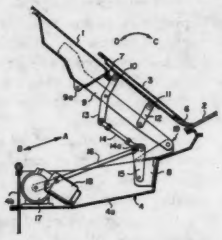
MOVABLE COWL COVER

Susumu Okazaki; Takeshi Yamamoto; Shinshi Kajimoto; Takeshi Konishi, all of Hiroshima; Naogi Hisanaga, and Takahiko Tanaka, both of Kosai, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Asmo Co., Ltd., Shizuoka, both of, Japan

Filed Aug. 2, 1988, Ser. No. 234,225
Claims priority, application Japan, Aug. 6, 1987, 62-198944
Int. Cl.[5] B62D *25/10*
U.S. Cl. 296—192 19 Claims

1. A movable cowl cover for selectively opening and closing a cowl box provided in a vehicle body between a rear edge of a front hood and a windshield, the front hood being mounted on the vehicle body to be swung open and closed about a hinge mounted on the vehicle body on a rear side of the rear edge of the front hood,

said cowl cover characterized by being opened and closed by a driving mechanism comprising a four-bar link mechanism including first and second links each of which is pivoted at one end thereof on hood extensions means mounted on the front hood and at the other end to structure on the lower surface of the cowl cover and which extend substantially in parallel spaced from each other in the longitudinal direction of the vehicle body, a driving means and a connecting mechanism for transmitting the



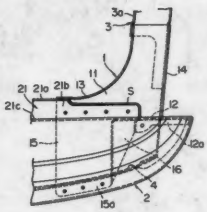
output power of the driving means to the four-bar link mechanism.

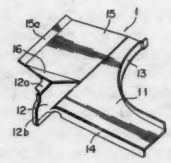
4,982,994

CORNER PATCH FOR REAR QUARTER PANEL-REAR SKIRT CORNER FOR AN AUTOMOTIVE VEHICLE

Akihiko Sekiguchi, Gunma, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1990, Ser. No. 524,543
Claims priority, application Japan, May 29, 1989, 1-62085
Int. Cl.[5] B62D *25/08*
U.S. Cl. 296—195 4 Claims





1. In a body structure of an automotive vehicle having a rear quarter panel outer with a recessed part for mounting a rear combination lamp, a rear skirt, and a patch including a member joining a rear portion of an upper part of the rear quarter panel outer and a side portion of an upper part of the rear skirt, the improvement of said patch which comprises:

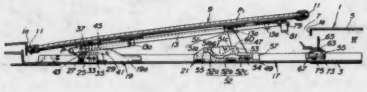
a sidewise extension plate extended from a side edge of the member secured to an upper edge portion of the recessed part so as to define a closed sectional portion together with the upper part of the rear quarter panel outer.

4,982,995

LID REGULATING DEVICE FOR SUN ROOF STRUCTURE

Jun Takahashi, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Jul. 8, 1988, Ser. No. 216,653
Claims priority, application Japan, Jul. 17, 1987, 62-177276; Jul. 17, 1987, 62-109115[U]
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] B60J 7/05, 7/19
U.S. Cl. 296—221 10 Claims



1. In a sun roof structure including a lid and a sun roof opening defined by a roof,

a lid regulating device comprising:

a guide rail extending along each side of said sun roof opening and secured to said roof;

a first sliding shoe slidably engaged with said guide rail, said first sliding shoe having an extension which is pivotally connected to a front portion of said lid, said extension having a stopper opening formed therethrough;

a stopper structure including a holder securedly mounted on said guide rail, a stopper pin axially movably held by said holder, and biasing means for biasing said stopper pin outwardly, said stopper pin being projected into said stopper opening of the extension of said first sliding shoe when said lid is brought to its fully closed position;

an operation lever pivotally connected to said first sliding shoe, said operation lever having a projection which, when the lid assuming the fully closed position is tilted downward, pushes said stopper pin against the force of said biasing means thereby to disengage said stopper pin from said stopper opening; and

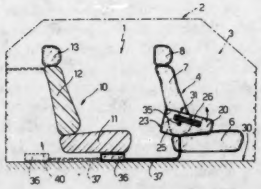
a second sliding shoe slidably engaged with said guide rail and supporting a rear portion of said lid, said second sliding shoe having a lift mechanism mounted thereon to tilt said lid upward and downward about said front portion of the lid.

4,982,996

AUTOMOTIVE SEATING SYSTEM FEATURING A TELEVISION SET

Alberto Vottero-Fin, Trinita, and Luigi Prato, Villarbasse, both of Italy, assignors to Fiat Auto S.p.A., Torino, Italy

Filed Feb. 14, 1990, Ser. No. 479,960
Claims priority, application Italy, Feb. 17, 1989, 5282 B/89
Int. Cl.[5] A47C 7/62
U.S. Cl. 297—194 6 Claims



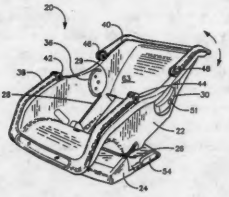
1. An automotive seating system comprising two side by side front seats with an armrest in between, and at least a rear seat; characterized by the fact that it comprises a television set built permanently inside said armrest so that the television screen defines at least part of the front side of the rear wall of said armrest.

4,982,997

BOUNCER INFANT CARRIER

Roy E. Knoedler, Boulder; Robert M. Parker, Aurora; William G. Au, Northglenn, and Albert W. Gebhard, Denver, all of Colo., assignors to Snugli, Inc., Lakewood, Colo.

Continuation of Ser. No. 228,531, Aug. 4, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 402,234
Int. Cl.[5] A47D 13/02
U.S. Cl. 297—296 10 Claims



1. An infant carrier comprising:

(a) a carrier body in which an infant can be placed, said carrier body including first and second sides with each of said first and second sides having an inner wall surface and first and second substantially arcuate-shaped slots being provided at each of said inner wall surfaces of said first and second sides respectively;

(b) a base which is capable of supporting said carrier body above a surface and is movably connected to said carrier body;

(c) connecting means for movably connecting said base to said carrier body, wherein said connecting means provides for positioning said carrier body and said base in at least two positions relative to one another and, for each of said two positions, an infant is supportable in said carrier body and in which, in a first position said carrier body and said base are substantially adjacent one another and substantially immobile relative to one another so that said carrier body is adapted to support the infant in order to carry the infant and, in a second position, said carrier body is located a distance away from said base so that said carrier body is adapted to support the infant in an inclined position relative to said base; and

(d) at least a first rotatable member attached to said carrier body adjacent to said first arcuate-shaped slot;

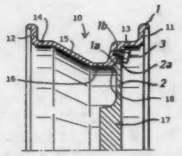
wherein said connecting means includes at least a first elongated member including an end portion and having a longitudinal axis, said elongated member end portion being held in said first arcuate-shaped slot and wherein said carrier body moves along said elongated member toward said base to travel from said second position to said first position during movement of said first rotatable handle as said elongated member end portion is guided in said first arcuate-shaped slot.

4,982,998

TWO PIECE CONSTRUCTION WHEEL FOR AN AUTOMOBILE

Ryozo Mikawa, Yokohama, Japan, assignor to Fortran Co., Ltd., Yokohama, Japan

Filed Apr. 21, 1989, Ser. No. 341,321
Int. Cl.[5] B60B *23/06*
U.S. Cl. 301—11 R 3 Claims



1. A wheel for an automobile comprising:

a cylindrical rim including a cylindrical portion and two flanges integrally formed together as one unit, said two flanges being formed at axial ends of the cylindrical portion to extend radially outwardly therefrom, said cylindrical portion including cylindrical first and second outer sections with inner and outer ends, respectively, a first connecting section fixed to the inner end of the first outer section, an oblique section fixed to the inner end of the second outer section and extending radially inwardly of the rim, and an intermediate cylindrical section situated between end portions of the first connecting section and the oblique section, said first connecting section extending radially inwardly from the inner end of the first outer section in the direction away from the first outer section at an angle close to a plane perpendicular to an axis of the cylindrical rim, and said oblique section being inclined at an angle smaller than an angle of the first connecting section relative to the first outer section so that the first connecting section is located close to the flange on the first outer section,

a center disk adapted to be situated inside the cylindrical rim, said center disk having a central portion, a second connecting section with an outer periphery thereof located outside and around the central portion, and a projection situated between the central portion and the second connecting section to surround the central portion, said second connecting section being inclined relative to the central portion so that when the first and second connecting sections abut against each other, the center disk orients perpendicular to the axis of the cylindrical rim, the projection engages the intermediate cylindrical section of the cylindrical rim and the outer periphery of the second connecting section abuts against the first outer section of the cylindrical rim, and

a plurality of connecting means for connecting the cylindrical rim and the center disk at the first and second connecting sections.

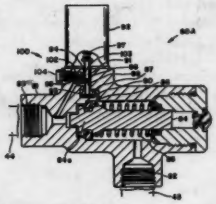
4,982,999

ADAPTIVE BRAKING SYSTEM DEFAULT ACTIVATED PROPORTIONING VALVE

Louis P. Rossigno, Granger; Robert F. Gaiser, Stevensville, and Robert B. Temple, Granger, all of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 29, 1989, Ser. No. 414,810
Int. Cl.[5] B60T *15/00*
U.S. Cl. 303—9.630 25 Claims

1. In an adaptive braking system for a vehicle, the system including proportioning valve means for proportioning fluid pressure communicated between fluid pressure producing means and at least one wheel brake of the vehicle, the proportioning valve means normally deactivated so that fluid pressure is transmitted therethrough without being proportioned by the proportioning valve means, the proportioning valve means being operatively connected with control means of the system, the control means responsive to a failure in the adaptive braking system so as to activate the proportioning valve means such that fluid pressure communicated to said wheel brake is proportioned during said failure.

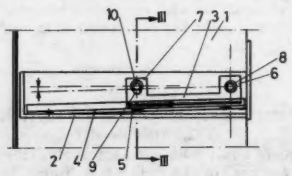


4,983,000

PIECE OF FURNITURE WITH AT LEAST ONE DRAWER

Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Oct. 10, 1989, Ser. No. 418,633
Claims priority, application Austria, Oct. 11, 1988, 2504/88; Oct. 11, 1988, 2505/88
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—333 21 Claims



1. In an article of furniture including at least one drawer mounted between two body side walls by a pull-out guide assembly and guided thereby for movement between inserted and withdrawn positions, said pull-out guide assembly comprising, on each of opposite sides of said drawer, a supporting rail mounted on a respective body side wall, and a pull-out rail longitudinally slidably guided relative to said supporting rail and mounted on a respective side of said drawer, the improvement wherein said pull-out guide assembly further comprises, on each of said opposite sides of said drawer:

means mounting said supporting rail adjacent a front end portion thereof to the respective said body side wall for pivotal movement about a horizontal axis relative to said respective body side wall; and

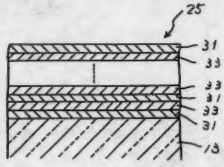
guide means, located at a rear end portion of said supporting rail, for guiding said pivotal movement of said supporting rail and for limiting the extend of said pivotal movement in opposite directions about said axis.

4,983,001

OPTICAL INTERFERENCE FILM HAVING HIGH AND LOW REFRACTIVE INDEX LAYERS INTER-LAYER CONNECTION OF WHICH IS STRENGTHENED

Akiko Hagiuda, and Akira Kawakatsu, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1988, Ser. No. 234,674
Claims priority, application Japan, Aug. 26, 1987, 62-210239
Int. Cl.[5] G02B 5/28; H01K 1/26
U.S. Cl. 350—1.6 10 Claims



1. An optical interference film comprising:

a high refractive index layer including at least one metal oxide selected from titanium oxide and tantalum oxide; and

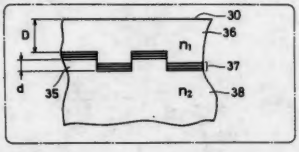
a low refractive index layer formed on the high refractive index layer, including silica and an amount greater than would be present due to molecular diffusion of at least one metal oxide the same as that of the high refractive index layer, the low refractive index layer having a prescribed refractive index lower than the high refractive index layer.

4,983,002

OPTICAL HEAD DEVICE

Shinsuke Shikama, and Eiichi Toide, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,584
Claims priority, application Japan, Oct. 6, 1987, 62-252000
Int. Cl.[5] G02B 5/18; G11B 7/00
U.S. Cl. 350—3.6 17 Claims



1. An optical head device comprising:

light source means for emitting a light flux;

plano-parallel optical beam separating means for reflecting said light flux into a zero-order diffracted light beam and a plurality of diffracted light beams onto an optical storage medium; and

photo-electric detector means for receiving light beams reflected from said optical storage medium through said plano-parallel optical beam separating means for detecting if light spots are focused properly on said optical storage medium and for providing a read signal indicative of information recorded on said optical storage medium as based upon said zero-order diffracted light beam and for monitoring displacement of said light spots with respect to an information track of said optical storage medium as based upon said plurality of diffracted light beams,

said plano-parallel optical beam separating means comprising

a flat substrate,

a diffraction grating formed on said flat substrate of periodic structure, index of refraction n2, and thickness d,

a half-mirror layer formed on said diffraction grating and said flat substrate, and

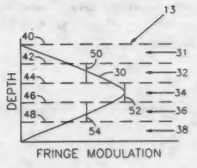
an overcoat layer, having a flat surface, of thickness D and index of refraction n1 formed on said half mirror layer such that an absolute value of phase shift caused by transmission through said diffraction grating and said overcoat layer is not greater than 1.01×10^{-2} (radian) so that the ratio of the intensity of positive and negative first order light beams, resulting from transmission diffraction of said light flux, relative to the intensity of a zero-order transmission diffraction light beam is not greater than 1.03×10^{-5} to minimize variation of a tracking error signal envelope relative to inclination of said optical storage medium.

4,983,003

ALTERNATE METHODS OF SIDE LOBE REDUCTION IN HOLOGRAMS

John E. Wreede, Monrovia, and James A. Arns, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 27, 1988, Ser. No. 263,655
Int. Cl.[5] G03H 1/02, 1/08
U.S. Cl. 350—3.61 11 Claims



4. In an improved holographic recording medium having a n efficiency curve which is substantially free of side lobes, the improvement comprising:

a plurality of operatively interfacing recording medium layers having varying amounts of photosensitivity wherein said recording medium layers blend together at their respective interfaces to provide gradual changes in photosensitivity.

4,983,004

APPARATUS FOR THREE-DIMENSIONAL VIEWING OF MAGNETIC RESONANCE IMAGING TOMOGRAMS

Naoya Takeya, Higashi-Murayama; Kazuhiro Honma, and Kiyofumi Matsuda, both of Tsukuba, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 556,464
Claims priority, application Japan, Jul. 25, 1989, 1-192387
Int. Cl.[5] G03H 1/02; G01R 33/48; A61B 5/055
U.S. Cl. 350—3.66 3 Claims

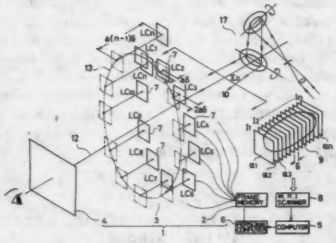
1. An apparatus for three-dimensional viewing of MRI tomograms, comprising:

a frame memory capable of storing a plurality of MRI tomograms;

image display means comprising a plurality of liquid crystal displays connected to said frame member, each of said liquid crystal displays having a display screen and being capable of independently displaying one of the plurality of MRI tomograms on said display screen, said liquid crystal displays being disposed such that their display screens

appear planar when seen from a common point and being positioned such that the spacing between each display screen and the next one in front or back of it is proportional to the spacing between the cross sections belonging to the MRI tomograms displayed on the display screens;

a hologram screen having a center disposed at a position



corresponding to said common point so that it faces each of said liquid crystal displays, and having recorded thereon multiple interference fringes of light obtained by illuminating said hologram screen with said light from the positions of said liquid crystal displays; and

means for illuminating the rear surfaces of the display screens with coherent light.

4,983,005

OPTOELECTRONIC INTEGRATED SEMICONDUCTOR DEVICE INCLUDING A SEPARATOR OF THE TE AND TM POLARIZATIONS

Remi Gamonal, Brunoy, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 28, 1989, Ser. No. 373,378
Claims priority, application France, Jul. 5, 1988, 88 09084
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.12 **14 Claims**

1. An optoelectronic integrated semiconductor device including a separator of the polarization TE and TM, this separator comprising two parallel and monomode optical guides G_1 and G_2, one of which receives at the input a luminous signal, and comprising means for carrying out the separation of this signal and these two components TE and TM, one component of which TE is transported to the output through one of the guides, while the other component TM is transported to the output through the other guide, characterized in that:

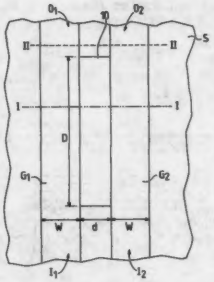
the guides are constituted by at least a heterostructure S/C_1 and by two parallel erected guiding ribbons R at the surface, said guiding ribbons being formed in a common layer structure including at least one heterostructure

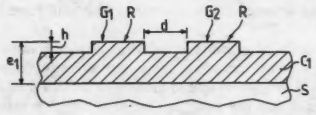
and the means for carrying out the separation of the components Te and TM consist of a metallic layer extending between the guiding ribbons R at the surface of the structure over a length D_1 whose value is correlated with the coupling length of the component TE $L_c(TE)$ by the relation

$$D=L_c(TE),$$

the parameters of the physical quantities of the device being chosen so that the relation:

$$L_c(TE)=2L_c(TM),$$





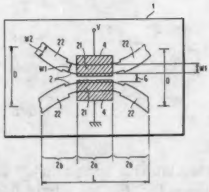
is satisfied, $L_c(TM)$ being the coupling length of the component TM.

4,983,006

POLARIZATION-INDEPENDENT OPTICAL WAVEGUIDE SWITCH

Hiroshi Nishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,024
Claims priority, application Japan, Mar. 29, 1988, 63-77898
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.14 **3 Claims**



1. An optical switch comprising:

first and second optical waveguides formed in a crystal substrate displaying an electro-optical effect, said first and second optical waveguides being closely disposed to each other, each of said first and second optical waveguides comprising a coupling optical waveguide connected between two curved optical waveguides;

at least two electrodes provided respectively in each of said first and second optical waveguides;

a directional coupler comprising said coupling optical waveguides for switching optical coupling between said first and second optical waveguides in response to a voltage applied to said electrodes; and,

an optical guiding part comprising said curved optical waveguides for inputting/outputting light to said directional coupler,

whereby the width of said curved optical waveguides of said optical guiding part is greater at least in part than the width of said coupling optical waveguides of said directional coupling part; and

wherein the effective refractive indices of each of said coupling optical waveguides of said first and second optical waveguides are optical for both ordinary and extraordinary light rays.

4,983,007

OPTICAL COUPLING DEVICE

Simon M James, Woodbridge; Mark Davison, Sunderland; Stephen Hornung, Diss, and Michael H. Reeve, Ipswich, all of England, assignors to British Telecommunications, London, England

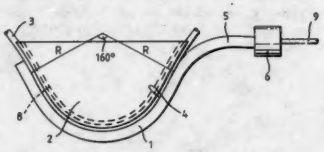
PCT No. PCT/GB88/00225, § 371 Date Sep. 11, 1989, § 102(e) Date Sep. 11, 1989, PCT Pub. No. WO88/07689, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 24, 1988, Ser. No. 399,503

Claims priority, application United Kingdom, Mar. 24, 1987, 8706929

Int. Cl.[5] G02B *6/26*

U.S. Cl. 350—96.15 **15 Claims**



2. An optical coupling device, for coupling low power levels of optical radiation out of an optical waveguide having a refractive index of n_1 at or near its surface, comprising a pick-up element having a refractive index n_3 and providing a curved optical waveguiding path therein, and clamping means moveable relative to the pick-up element for clamping the optical waveguide into a curved position which at least substantially conforms to the inner side of the curved path, the clamping means acting in use to clamp the optical waveguide against the inner side of the curved path, the refractive indices of the pick-up element and the surface of the optical waveguide, n_3 and n_1, and the radius of curvature, R, in mm of the inner surface of the curved path portion of the pick-up element being chosen such that $n_3 > n_1(1-0.125/R)$, such that optical radiation is leaked from the optical waveguide in use, and coupled into the curved path.

4,983,008

STRAINED DISTRIBUTED OPTICAL FIBER COMMUNICATION SYSTEM

Bruce D. Campbell, Portola Valley, and Joseph Zucker, Foster City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 87,957, Aug. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 899,358, Aug. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 899,363, Aug. 22, 1986, abandoned. This application Nov. 1, 1988, Ser. No. 265,735

Int. Cl.[5] G02B *6/28*

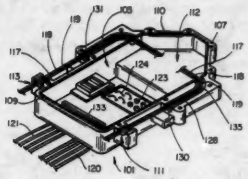
U.S. Cl. 350—96.16 **9 Claims**

1. A subscriber telephone system for interconnecting a plurality of subscriber telephones and at least one telephone central office or remote extension thereof for communicating information therebetween, comprising:

a plurality of subscriber telephones;

means for interconnecting the telephones and the telephone central office or remote extension thereof, the interconnecting means including at least one optical fiber comprising a glass core surrounded by a glass cladding surrounding by a protective coating in contact with the cladding, the coating being substantially transparent to light guided by the core used to represent the information and having an index of refraction throughout its thickness which is greater than that of the cladding, the fiber having a predetermined proof stress strength;

a plurality of optical taps serially disposed on the optical fiber and in communication with the plurality of telephones, each tap including bending means for maintaining a bend in the fiber of a radius sufficiently small so as to enable either light injection into or light withdrawal from



the core of the optical fiber by passing the light being injected or detected through a side of the fiber cladding and coating at an unbroken intermittent section of the fiber, each fiber bend having a maximum radius of curvature sufficiently small so as to impose a maximum static stress on the fiber glass in excess of one-half the fiber proof stress, the bending means maintaining the maximum stress on the fiber whenever light is being transmitted on the fiber regardless of whether one or more telephones associated with the tap is in operation or is operational;

a plurality of means for enclosing various ones of the plurality of taps and bends associated therewith so as to provide a water-tight seal for the various ones of the taps capable of keeping water located outside the enclosing means from entering an interior thereof and contacting the fiber taps and associated bends.

4,983,009

LIGHT TRANSMITTING DEVICE UTILIZING INDIRECT REFLECTION

Robert W. Musk, Ipswich, United Kingdom, assignor to BT&D Technologies Limited, England

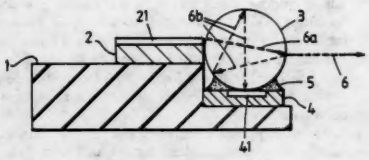
PCT No. PCT/GB88/01047, § 371 Date Jul. 28, 1989, § 102(e) Date Jul. 28, 1989, PCT Pub. No. WO89/05467, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 28, 1988, Ser. No. 391,543

Claims priority, application United Kingdom, Dec. 3, 1987, 8728342

Int. Cl.[5] G02B *6/32*; H01J *5/16*; H01L *39/02*

U.S. Cl. 350—96.18 **19 Claims**



1. An optical transmitting assembly comprising:

an optical source having an optical output coupled to pass

directly through a light refraction means towards a first light output port, and

an optical monitoring detector arranged to receive scattered light output from the source indirectly via at least one internal reflection of said light refraction means and a second light output port,

wherein the source, the detector and the light refraction means are mounted on a common support structure.

4,983,010

SYSTEM FOR CONNECTING LIGHT WAVEGUIDE BUSES AND COAXIAL CABLE BUSES

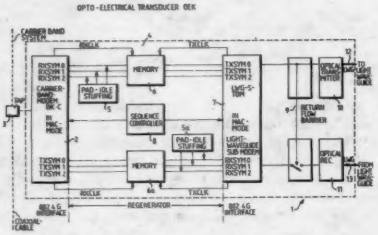
Wolfgang Popp, Darmstadt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Oct. 25, 1989, Ser. No. 426,299

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1988, 3836224

Int. Cl.[5] G02B *6/26*; G02F *1/00*

U.S. Cl. 350—96.20 **7 Claims**



1. In a system for connecting light waveguide buses and coaxial cable buses operating according to the token passing principle, the coaxial cable buses each being provided with electrical terminal access means for transmitting electrical data signals onto and receiving electrical data signals from the coaxial cable bus, the improvement comprising:

an opto-electrical converter disposed between a terminal access means and a light waveguide bus, said converter including:

carrier band modem means operatively connected to the terminal access means and having a standardized carrier band interface for producing data signals at said interface according to a predetermined token bus standard;

optical transceiver means coupled to the light waveguide bus for converting electrical signals into optical signals and transmitting the optical signals onto the light waveguide bus and for receiving optical signals from the light waveguide bus and converting the optical signals into electrical signals;

light waveguide sub-modem means having an interface, operatively coupled to the interface of said carrier band modem means and to said optical transceiver means, for generating electrical signals according to a predetermined optical token bus light waveguide standard and feeding the electrical signals to said optical transceiver means, and for generating electrical data signals according to the predetermined token bus standard from signals conforming to the predetermined optical token bus waveguide standard received from said optical transceiver means;

a common sequence controller operatively connected to said carrier band modem means and said light waveguide sub-modem means for controlling functions in said carrier band modem means and said light waveguide sub-modem means;

return flow barrier means operatively connected between said optical transceiver means and said light waveguide sub-modem means for preventing received data from the optical transceiver means from re-circulating through said optical transceiver means and the light waveguide bus; and

regenerator means operatively connected between said carrier band modem means and said light waveguide sub-modem means and controlled by said sequence controller for regenerating the data signals from said carrier band modem means and said light waveguide sub-modem means.

4,983,011

OPTOELECTRICAL CONNECTOR DEVICE AND OPTICAL PLUG SOCKET THEREFOR

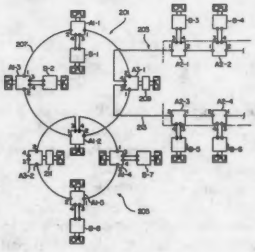
Toshiyasu Tanaka; Nozomi Tsuzaki, both of Yokohama, and Toyohiro Kobayashi, Yaizu, all of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 20, 1989, Ser. No. 438,210

Claims priority, application Japan, Nov. 18, 1988, 63-290288

Int. Cl.[5] G02F *1/00*; H04J *14/00*; G02B *6/26*

U.S. Cl. 350—96.20 **6 Claims**



1. An optoelectrical connector device comprising:

first and second optical terminals optically intercepting and respectively optically connected to a main optical transmission line for communicating optical signals between a plurality of information processing units which are each optically connected to said main optical transmission line,

a third optical terminal optically connected to a subsidiary optical transmission line for communicating optical signals between an external processing unit and said plurality of information processing units optically connected to said main optical transmission,

photoelectric conversion means for converting between electrical and optical signals having first and second light receiving means for converting optical signals to electrical signals and first and second light emitting means for converting electrical signals to optical signals, said photoelectric conversion means being electrically connected to one of said plurality of information processing units and optically connected to said main optical transmission line,

wherein the first optical terminal is optically connected to the second light receiving means and first light emitting means, the second optical terminal is optically connected to the first light receiving means and the second light emitting means, and the third optical terminal is optically connected to the first light receiving means.

4,983,012

OPTICAL FIBER CONNECTOR

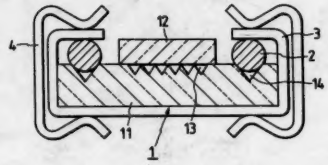
Kazuhito Saito; Toshiaki Kakii; Hidetoshi Ishida, and Shuzo Suzuki, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 23, 1990, Ser. No. 512,415

Claims priority, application Japan, Jun. 23, 1989, 1-161676

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 4 Claims



1. An optical connector for connecting optical fibers in proper axial alignment with each other, said optical connector comprises:

an optical fiber guide member consisting of a grooved substrate and a cover plate, said substrate having optical fiber guide grooves and guide pin grooves cut into a top surface thereof, and said cover plate being joined to said substrate in such a way that it covers the optical fiber guide grooves but leaves at least part of the guide pin grooves exposed;

a member being movable in the vertical direction of the guide pin grooves and positioned above said grooves in such a way that said movable member elastically presses downward guide pins positioned on said guide pin grooves when optical fibers are joined by said optical connector; and

coupling clips for enhancing the force of elastic pressure being exerted on said guide pins so as to secure the joining of optical fibers.

4,983,013

OPTICAL CABLE COMPRISING A CARRIER MEMBER

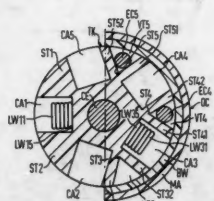
Peter Dotzer, Munich; Heinz Glaser, Germering; Ernst Mayr, Starnberg, and Ulrich Oestreich, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 25, 1989, Ser. No. 398,662

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 3829410

Int. Cl.[5] G02B *5/16*

U.S. Cl. 350—96.23 15 Claims



1. In an optical cable having a longitudinally extending carrier member having outwardly extending integral webs extending helically in a longitudinal direction of the member to form outwardly accessible, helically extending chambers, said chambers serving for the acceptance of light waveguides and being separated from one another by said webs, the improvements comprising an outer surface of each of the webs having an outwardly opening depression having a cross sectional area smaller than a cross sectional area of the chambers.

4,983,014

BUNDLE OF OPTICAL FIBERS FOR TRANSMISSION OF ELECTROMAGNETIC RADIATION OF HIGH LUMINOUS INTENSITY

Kurt Nattermann, Ingelheim, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,488

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1988, 3835325

Int. Cl.[5] G02B *6/04*

U.S. Cl. 350—96.24 26 Claims

1. A flexible fiber bundle comprising a plurality of multimode single fibers having a core and cladding and combined at the ends of the fiber bundle, for high-energy transmission of continuous or pulsed electromagnetic radiation with pulse durations of more than 1 μs and a luminous intensity of from 10^5 W/(rad·mm)^2 to $1.6 \cdot 10^8$W/(rad·mm)^2, and for pulsed laser beams having pulse durations of less than 1 μs with a luminous intensity of 10^6 W/(rad·mm)^2 to $8 \cdot 10^8$ W/(rad·mm)^2, said fiber bundle having:

(a) a cross-sectional area A_b in mm^2 of $(1 \ldots 6) \cdot P/I_{dam}$, wherein P is the maximum radiant power (pulse peak power) in watts and I_{dam} is the damage threshold value of the fiber bundle in W/mm^2, and

(b) the numerical aperture NA of the fibers in the fiber bundle amounts to the maximum of the quotient of

$$\left\{ \frac{\theta(\phi) \cdot D(\phi)}{D_b(\phi)} \right\} \text{multiplied by } (0.5 \ldots 1)$$

wherein $\theta(\phi)$ is the full angular divergence of the beam at the output of the radiation source in rad in dependence on the angle ϕ perpendicular to the beam axis; $D(\phi)$ is the chord and/or diameter of the beam passing through the apex of the angle ϕ in mm at the output of the radiation source in dependence on the angle ϕ; $D_b(\phi)$ is the chord and/or diameter of the beam passing through the apex of the angle ϕ in mm at the input coupling end of the fiber bundle in dependence on the angle ϕ, and the numerical aperture is no smaller than 0.05 and no larger than 0.35, and

(c) the core diameter of the fibers of the fiber bundle is $D_k = NA^2 \cdot b \cdot R$, NA meaning the numerical aperture, R meaning the required minimum bending radius in mm, and b meaning a constant having values from 0.03 to 0.24 but being larger than $0.8 \cdot \lambda/NA$ wherein λ is the wavelength of the radiation to be transmitted in mm, and NA means the numerical aperture of the fibers.

4,983,015

SYSTEM FOR THE DISPLAY OF COLOR IMAGES USING AN OPTICAL MIXER WITH FIBERS IN ORDERED ARRANGEMENT

Jerome Bourguignat, Merignac, and Jean-Blaise Migozzi, Orsay, both of France, assignors to Thomson CSF, Puteaux, France

Filed Jun. 29, 1989, Ser. No. 373,048

Claims priority, application France, Jul. 8, 1988, 88 09304

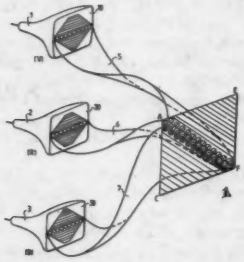
Int. Cl.[5] G02B *6/06*

U.S. Cl. 350—96.25 7 Claims

1. A system for the display of color images comprising:

n display devices, where n is a whole number greater than 1, respectively provided with n electronic scanning screens to form n monochrome elementary images with n distinct chrominance values, respectively on the screens, from one of said color images; and

an optical mixing device to mix the n elementary images and form a resultant color image in a plane of observation, said mixing device being formed by optical fibers, each having a first end and a second end and being ordered to form groups of n fibers, each group having a first end and a



second end, the fibers of one of said groups terminating, at said first end, at the n screens as dots of the elementary images and terminating, at said second end, in the observation plane, substantially as a dot which is the dot of the resultant image to be displayed, corresponding to the dot considered, for the group of the original image.

4,983,016

TRANSMISSION PROJECTION SCREEN AND METHOD OF MANUFACTURING THE SAME

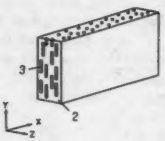
Yoshiharu Yamamoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 29, 1990, Ser. No. 471,612

Claims priority, application Japan, Jan. 30, 1989, 64-20004

Int. Cl.[5] G03B *21/60*

U.S. Cl. 350—126 **16 Claims**



1. A transmission projection screen comprising a light transmissible resin material and a plurality of bar-like members of another resin material which is different in index of refraction from and not soluble in said light transmissible resin material, the bar-like members being dispersed in the light transmissible resin material and directing in a same direction.

4,983,017

OPTICAL HEAD DEVICE FOR READING INFORMATION STORED IN A RECORDING MEDIUM

Shigeki Tsuji, and Taizo Yokota, both of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 26, 1989, Ser. No. 385,457

Claims priority, application Japan, Aug. 2, 1988, 63-193660; Aug. 2, 1988, 63-193661

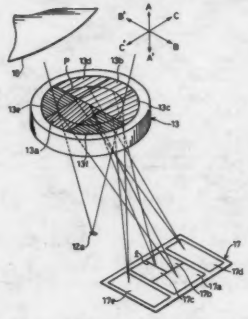
Int. Cl.[5] G02B *5/18, 27/44*

U.S. Cl. 350—162.17 **23 Claims**

1. A diffraction element for an optical head device for reading information stored in a recording medium by utilizing a light beam from a light source which converges onto the recording medium and a beam reflected from the recording medium which is received by a light receiving element to read information stored on the recording medium, comprising:

first diffraction grating means for dividing a portion of the light beam from the light source into a pair of first order diffracted beams utilized for reading tracking errors, and

second diffraction grating means for producing from a remaining portion of the light beam from the light source a



zero order diffracted beam utilized for reading the information stored on the recording medium and for guiding said pair of first order diffracted beams and said zero order diffracted beam reflected from the recording medium to the light receiving element;

said first and second diffraction grating means being positioned at different regions and being positioned in a same plane.

4,983,018

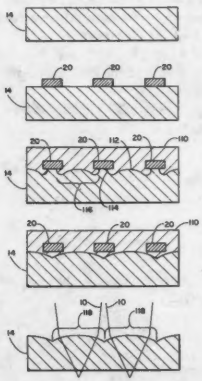
METHOD AND APPARATUS FOR PROVIDING A MOSAIC LENS ARRAY

David L. Jungkman, Hudson, N.H., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 2, 1989, Ser. No. 388,609

Int. Cl.[5] G02B *27/00*

U.S. Cl. 350—167 **4 Claims**



1. A method for etching a plurality of lenses in a predetermined pattern from an optically transparent substrate wherein the method comprises the steps of:

(a) preparing the substrate surface to receive an etchant mask;

(b) depositing an etchant mask on the substrate in the pattern of the plurality of lenses to be formed;

(c) etching the substrate by application of an etchant; and
(d) stopping the etching process when the etchant has etched away the substrate under the mask and separates the substrate from the mask.

4,983,019

ENDOSCOPE LIGHT SOURCE APPARATUS

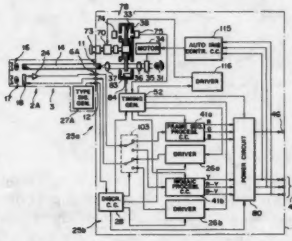
Yuji Ikuno, Oume; Toshiaki Nishikori, Sagamihara; Akihiko Miyazaki; Kazunari Nakamura, both of Hachioji; Fumiyuki Onoda, Futyu; Hiromasa Suzuki, Akishima; Takeaki Nakamura, Hino; Yoshinao Oaki, Hachioji; Atsushi Kidawara, Tachikawa; Masahide Kanno; Hisao Yabe, both of Hachioji, and Shinichi Katoh, Oume, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 190,963, Mar. 6, 1988, abandoned. This application Jun. 13, 1990, Ser. No. 538,610

Claims priority, application Japan, May 6, 1987, 62-110053; May 6, 1987, 62-110054; Feb. 19, 1988, 63-37744; Feb. 19, 1988, 63-37745; Feb. 19, 1988, 63-37747; Feb. 25, 1988, 63-24530; Feb. 26, 1988, 63-44704; Feb. 26, 1988, 63-44705; Feb. 26, 1988, 63-44707; Feb. 26, 1988, 63-44702; Apr. 28, 1988, 63-105973

Int. Cl.[5] G02B *5/22*; A61B *1/06*

U.S. Cl. 350—313 24 Claims



1. An endoscope light source apparatus for transmitting an illuminating light to an endoscope comprising:
a light source emitting the illuminating light;
an output surface for transmitting said illuminating light to the endoscope;
a housing for enclosing said light source and for supporting said output surface, wherein said housing includes an inserting aperture disposed in a light path between said light source and said output surface for receiving an object therein;
a cassette having a structure cooperative with said inserting aperture such that said cassette is removably insertable in said inserting aperture and in the light path between said light source and said output surface;
a light transmitting means, disposed within said cassette and thus in the light path between the light source and the output surface, for sequentially transforming the illuminating light in the light path into a light beam having one of a plurality of different wavelengths, said light transmitting means comprising a rotatable rotary filter having a connecting part thereon, wherein said connecting part connects with a driving means located externally of said cassette for rotating said rotary filter.

4,983,020

DYEING RESISTANT INSULATION FILM OF HIGH QUALITY FOR A COLOR FILTER FOR USE IN A SOLID-STATE IMAGE PICKUP ELEMENT

Toshimasa Nakayama, Hiratsuka; Hidekatsu Kohara, Chigasaki; Naoki Aoyanagi, Samukawa, and Daisuke Hayashi, Tokyo, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan

Continuation of Ser. No. 200,119, May 27, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,523

Claims priority, application Japan, May 28, 1987, 62-129821

Int. Cl.[5] G02B *5/22*

U.S. Cl. 350—317 9 Claims

1. A color filter for use in a solid-state image pickup element, comprising a patterned, dyed layer and a dyeing-resistant insulation film formed over the patterned, dyed layer, said dyeing-resistant insulation film comprising a copolymer of glycidyl methacrylate and methyl methacrylate.

4,983,021

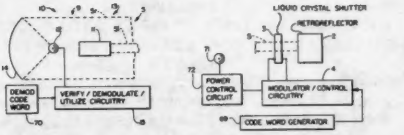
MODULATED RETROREFLECTOR SYSTEM

James L. Fergason, 92 Adam Way, Atherton, Calif. 94025

Filed Aug. 10, 1988, Ser. No. 230,781

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—332 34 Claims



1. A reflector system, comprising
a reflector for reflecting incident electromagnetic energy,
a shutter for controlling at least one of electromagnetic energy incident on and electromagnetic energy reflected by said reflector, said shutter comprising a field effect scattering type liquid crystal shutter including plural volumes of liquid crystal material in a containment medium
a controller for controlling said shutter to control such incident or reflected electromagnetic energy, and
coding means for causing said controller to modulate such energy according to a prescribed code.

4,983,022

LIQUID CRYSTAL DISPLAY DEVICE

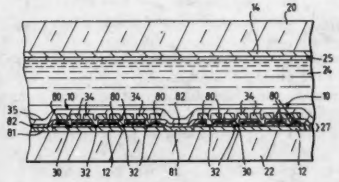
John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1988, Ser. No. 174,565

Claims priority, application United Kingdom, Apr. 16, 1987, 8709186

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—333 8 Claims



1. A liquid crystal display device comprising

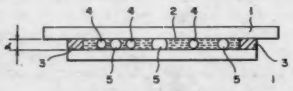
(a) a pair of spaced supporting plates,
(b) a liquid crystal material disposed between said supporting plates,
(c) a plurality of picture elements disposed in a matrix array, wherein each of said plurality of picture elements is defined by opposing electrodes disposed on said supporting plates,
(d) a plurality of switching elements disposed on one of said two supporting plates,
(e) a plurality of address lines disposed on said one of said two supporting plates, wherein said picture element electrodes on said one of said two supporting plates overlies both said switching elements and associated address lines to said one of said two supporting plates, said switching elements being connected in series between said picture element electrodes and said address lines, and
(f) at least one storage capacitor disposed between each of said picture elements and said one of said two supporting plates, wherein said storage capacitors include at least one conductive layer disposed on said one supporting plate and an electrically insulating layer disposed between said conductive layers and said picture element electrodes, said conductive layers screening said picture element electrodes from associated underlying address lines to minimize capacitive coupling between said picture element electrodes and said associated address lines.

4,983,023

LIQUID CRYSTAL DISPLAY PANEL WITH POLYMER SPACERS CONTAINING A PERCENTAGE OF EPOXY GROUPS

Kenichi Nakagawa, Nara; Takeshi Kitazawa, Nishinomiya, and Takashi Kitamura, Yamaguchi, all of Japan, assignors to Sharp Kabushiki Kaisha; Kitazawa Yakuhin Co., Ltd., both of Osaka and Tosoh Corporation, Yamaguchi, all of, Japan

Filed Oct. 6, 1988, Ser. No. 254,036
Claims priority, application Japan, Oct. 7, 1987, 62-255252
Int. Cl.[5] G02F *1/133*
U.S. Cl. 350—344 **9 Claims**



1. A liquid crystal display panel comprising at least two base plates spaced by a sealant on the peripheral portion of the plates and liquid crystal in the space between the base plates, wherein said liquid crystal contains as a spacer rigid particles and polymer particles having 10 to 30% by weight of an epoxy group.

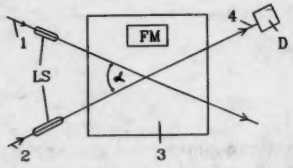
4,983,024

OPTICAL PHASE TO AMPLITUDE DEMODULATION

Simon A. Boothroyd, Ottawa; Jacek Chrostowski, Gloucester, and Maurice S. O'Sullivan, Ottawa, all of Canada, assignors to National Research Council Canada, Ottawa, Canada

Filed Oct. 5, 1989, Ser. No. 417,490
Int. Cl.[5] G03H *1/02*; H01S *3/10*
U.S. Cl. 350—354 **6 Claims**

1. The method of optical phase to amplitude demodulation by two wave mixing comprising:
intersecting two mutually coherent beams of light inside a Kerr medium;
one of said beams being unmodulated and the other being phase modulated;
said Kerr medium being non-linear and characterized by an equation $n=n_0+n_2I$;
where n is the local refractive index of the medium at a point of interest, n_0 is the linear refractive index of the medium, n_2 is the nonlinear refractive index of the medium and I is the light intensity at said point of interest;
whereby to generate an amplitude modulated output beam; wherein;
said nonlinear refractive index of the medium is characterized by $n_2=n_2'+in_2''$;



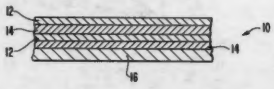
where n_2' is the dispersive component and n_2'' is the absorptive component;
the method comprising selecting values of n_2' and n_2'' to obtain a desired value of the phase angle ϕ;
where $\phi=\tan^{-1}(-n_2''/n_2')$;
and where said phase angle ϕ determines an operating point of said demodulator.

4,983,025

MAGNETO-OPTICAL THIN FILM

Shizuo Umemura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Feb. 1, 1989, Ser. No. 304,651
Claims priority, application Japan, Feb. 5, 1988, 63-25488
Int. Cl.[5] G02F *1/09*
U.S. Cl. 350—377 **7 Claims**



1. A magneto-optical recording medium including an ultrathin magneto-optical film capable of attaining a commercially satisfactory carrier to noise (C/N) ratio and having an improved figure of merit so that the Kerr rotation angle is enhanced while the reflectance is not substantially reduced, wherein said thin film comprises a substrate supporting a laminate formed of at least two ferromagnetic alloy thin layers, each of said layers having a thickness of from 30 to 260 Å alternately layered with at least two dielectric thin layers each having a thickness of from 30 to 500 Å and made of a material with a complex refractive index, wherein the real part of said index is 2.5 or less and the imaginary part of said index is 0.2 or less, and the total thickness of said laminate is from 300 to 2000 Å.

4,983,026

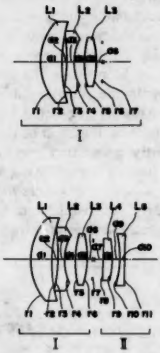
FOCAL LENGTH CHANGEABLE LENS SYSTEM

Yoshinobu Kudo, and Kazuo Kimura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 137,518
Claims priority, application Japan, Dec. 27, 1986, 61-311448
Int. Cl.[5] G02B *15/08*
U.S. Cl. 350—422 **6 Claims**

1. A passive automatic temperature corrected focal length changeable lens system having an optical axis, comprising:
a master lens group of a positive refractive power having at least one first lens element made of a synthetic resin material, and
a rear lens group of a negative refractive power retractably

positioned on the image side of the master lens group on the optical axis and having at least one second lens element made of a synthetic resin material, and having an opposite power to the first lens element, the synthetic resin materials of the first and second lens elements being complementarily responsive to any temperature change within a predetermined range of temperature that a user may experience, the respective positions of the first and second lens elements and their groups along this optical



axis and the specific refractive powers for each of the synthetic resin lens elements enable a temperature compensation for the predetermined temperature range, without a corresponding relative movement imposed on the first and second lens elements along the optical axis, wherein any temperature change in position of an image plane introduced by one synthetic resin lens element is compensated by the corresponding temperature responsive change introduced by the other synthetic resin lens element.

4,983,027

COMPACT ZOOM LENS SYSTEM WITH A HIGH ZOOM RATIO

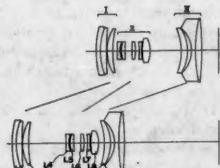
Ayako Kojima, and Hisayuki Masumoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 331,627

Claims priority, application Japan, Mar. 31, 1988, 63-80148; Mar. 31, 1988, 63-80149; Jun. 14, 1988, 63-147536; Jul. 5, 1988, 63-168132; Jul. 5, 1988, 63-168133

Int. Cl.[5] G02B *15/14, 13/18*

U.S. Cl. 350—427 **38 Claims**



1. A compact zoom lens system with a high zoom ratio comprising from object side to image side:

a first lens unit of a positive refractive power;

a second lens unit of a positive refractive power with a first variable air space formed between the first and second lens units; and

a third lens unit of a negative refractive power with a second variable air space formed between the second and third lens units;

wherein the first lens unit and the third lens units are shiftable from the image side to the object side and the second lens unit is shiftable so that the first variable air space increases and the second variable air space decreases in the zooming operation from the shortest focal length (fS) to the longest focal length (fL);

and wherein the third lens unit includes at least an aspherical surface and fulfills the following condition:

$$\frac{|X| - |X_0|}{C_0(N' - N)} > 0$$

$$0.20 < (L_2/FM) \cdot (fS/fL) < 0.50$$

wherein, C_0 represents the curvature of the standard spherical surface of the aspherical surface, X represents the distance along the optical axis from an intersection of the standard spherical surface and the optical axis of the lens system to the aspherical surface at the height from the optical axis Y and is expressed as the following equation:

$$X = X_0 + \sum_i A_{2i}Y^{2i}, X_0$$

represents the distance along the optical axis from the intersection to the standard spherical surface at the height Y and is expressed as the following equation: $X_0=C_0Y^2/\{1+(1-C_0^2Y^2)\}$, A_{2i} represents the aspherical coefficients, N represents the refractive index of the media at the object side of the aspherical surface, N' represents the refractive index of the media at the image side of the aspherical surface, L_2 represents the length from the surface of the object side end of the second lens unit to a film on the shortest focal length condition and FM represents the diagonal length of a frame of the film.

4,983,028

DEVICE FOR FIXING A FRAGILE OBJECT, SUCH AS MIRROR

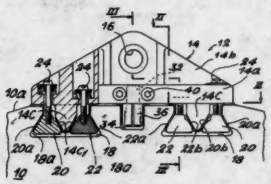
Philippe Dereune, Mougins; Michel Louis, Nice; Jacques Camous, Antibes, and Michel Tarreau, Savigny sur Orge, all of France, assignors to Aerospatiale Societe Nationale Industrielle and REOSC (SA Recherches et Etudes D'Optique et Sciences), Ecoles, both of, France

Filed Dec. 28, 1989, Ser. No. 458,317

Claims priority, application France, Dec. 29, 1988, 88 17399

Int. Cl.[5] G02B *7/18*

U.S. Cl. 350—609 **11 Claims**



1. Device for fixing a fragile object, such as a mirror, and comprising:

at least one sectional dovetail-shaped groove formed in said object, said groove comprising two non-opening extremities;

at least one pair of thin strips w1th a trapezoidal section suitable for being mounted into said groove so that each thin strip is in contact with one flat lateral slanted face of the groove;

a supporting block placed opposite said groove and bearing at least one locking member suitable for being placed between the thin strips so as to keep them against said slanted lateral faces;

screws screwing each of the thin strips to the supporting block; and

at least one spring washer inserted between said supporting block and the head of each screw.

4,983,029

EYEGLASS FRAME HAVING TI-NI-V ALLOY ELEMENT WITH IMPROVED WEAR COMFORTABILITY

Shoichi Sato, Miyagi, Japan, assignor to Tokin Corporation, Miyagi and Nakanishi Optical Corporation, Osaka, both of, Japan

Filed Apr. 20, 1989, Ser. No. 341,119
Claims priority, application Japan, Apr. 21, 1988, 63-96737
Int. Cl.[5] G02C *5/14, 5/02*
U.S. Cl. 351—41 **6 Claims**

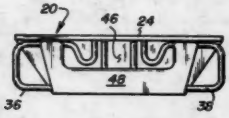
1. In an eyeglass frame comprising bridge means connecting a pair of lens fixing rims and temples connected to the rims, respectively, the improvement wherein at least one element of said bridge means and said temples is made of Ti-NI-V alloy having a super elasticity over a temperature range including a relevant range of 0°–20° C., said Ti-Ni-V alloy comprising V 0.25–2.0 at. % and the balance of Ni and Ti with an atomic ratio Ni/Ti of 1.02–1.06, said super elasticity being characterized by a stress-strain curve having a generally rectangular hysteresis loop wherein strain gradually increases with increase of stress and rapidly and suddenly increases at an elevated stress while strain gradually reduces with reduction of stress and rapidly and suddenly reduces at an reduced stress.

4,983,030

RETAINING MECHANISM FOR EYEGLASSES HAVING INTERCHANGEABLE LENSES

Roy L. Chandler, Burleson, Tex., assignor to Up To Date, Inc., Arlington, Tex.

Filed Oct. 8, 1987, Ser. No. 106,405
Int. Cl.[5] G02C *1/00, 5/00*
U.S. Cl. 351—86 **19 Claims**



1. A mechanism adapted for cooperation with certain fixed prongs in selectively holding lenses in eyeglasses when the mechanism is mounted on an eyeglass support frame adjacent the bridge, so that the mechanism is adjacent two potentially replaceable lenses, comprising:

(a) a housing having a generally elongated body with a top, a bottom, and two open ends, and the housing having an interior which is in communication with the two open ends, and the housing having an exterior that is configured to foster connection to the frame of the eyeglasses at the bridge thereof;

(b) a wire-like member projecting outwardly from each of the two open ends of the housing, each of said wire-like members normally projecting beyond an end of the housing for a distance that is sufficient to retain one of the lenses in a rim cavity associated with the eyeglass frame, and each of said wire-like members being temporarily retractable to a position inside the housing such that the lens associated with the retracted member may be selectively removed from its associated cavity; and

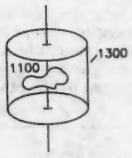
(c) biasing means for holding each of the wire-like members in their outwardly projecting positions, and at least a portion of said biasing means being temporarily deflectable so that the wire-like members may be retracted, and a lens being easily removable and replaceable when its associated wire-like member is retracted.

4,983,031

THREE-DIMENSIONAL VOLUMETRIC DISPLAY SYSTEM

Dennis J. Solomon, P.O. Box 289, Yarmouthport, Mass. 02675

Filed Jul. 13, 1988, Ser. No. 218,581
Int. Cl.[5] G03B *21/00*
U.S. Cl. 353—10 **15 Claims**



1. An improved method for the encoding and display of a three-dimensional image consisting of, the steps of:

the encoding of a three-dimensional image or object into a data-storage format, said encoding being the transformation of an object space cylinderical cooordinate system to a surface consisting of concentric bands where the radial distance of each point of the object space relative to a central axis defines proportionally the radial distance of concentric band on the data-storage format surface to which it is assigned, where the angular position of each point in the object space relative to a reference radian defines proportionately the angular position on the data-storage format surface of the corresponding point, and where the altitude of each point of the object space relative to a reference plane defines proportionately the position of the corresponding point in the altitudinal line on the data-storage format surface;

the scanning of each concentric band of the data-storage format surface by a linear scanner positioned generally perpendicular to circumference of the concentric band;

the transformation of the aforementioned linear scans into a two-dimensional array representative of a plane of the object space, and

the projection of the aforementioned two-dimensional arrays onto a moving surface such that a representation of the object space is displayed.

4,983,032

PROJECTION SYSTEM

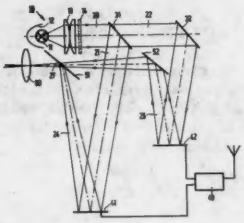
Adrianus H. J. Van Den Brandt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 327,288, Mar. 22, 1989. This application Jan. 12, 1990, Ser. No. 463,752

Claims priority, application Netherlands, Sep. 1, 1989, 8902205

Int. Cl.[5] G03B *21/00*; G02F *1/13*

U.S. Cl. 353—30 7 Claims



1. A projection system comprising a radiation source unit (10) for generating a radiation beam (20), a modulation system for modulating the radiation beam in accordance with a picture to be displayed, and a projection lens system (60) for projecting the picture to be displayed on a projection screen, said modulation system having at least one color-selective mirror (31) for splitting the radiation beam to sub-beams (21, 22) and at least a first and a second reflective light valve (41, 42) for reflecting and modulating the sub-beams (24, 25), characterized in that the axes of the radiation path of the radiation beams incident on the light valves (41, 42) and reflected by the light valves extend at an angle to the respective normals of the planes of the light valves.

4,983,033

AUTOMATIC RANGE FINDER FOR CAMERA

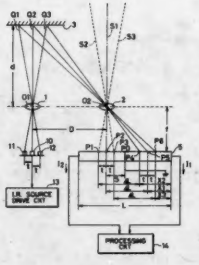
Koji Suzuki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 649,580, Sep. 12, 1984. This application May 21, 1987, Ser. No. 52,341

Claims priority, application Japan, Sep. 14, 1983, 58-169567

Int. Cl.[5] G03B *13/36*

U.S. Cl. 356—4 3 Claims



1. A range finder, comprising;

a plurality of light sources for applying a plurality of infrared beams to an object for distance measurement;

an infrared source drive circuit for causing said plurality of light sources to sequentially emit infrared beams;

a light projecting lens provided on optical axes of said light sources;

a condenser lens positioned a predetermined base length apart from said optical axes of said light sources, an optical axis of said condenser lens being parallel to an optical axis of said light projecting lens;

said light projecting lens and said condenser lens being fixed in position relative to said light sources,

a light detecting element having a light receiving surface arranged perpendicular to said optical axis of said condenser lens, said light detecting element producing first and second signals indicative of a position of a light spot on said light receiving surface;

said light sources being positioned apart from one another by a predetermined uniform distance; and

processing circuit means for determining, for values of said first and second signals produced by said light detecting element for each of said light sources, which of said values corresponds to an object closest to said range finder and for setting a focus position of said camera in accordance with said determination, said processing circuit means including means for correcting a value obtained from said first and second signals in accordance with a distance correction signal having a magnitude determined in accordance with said uniform distance.

4,983,034

COMPOSITE INTEGRITY MONITORING

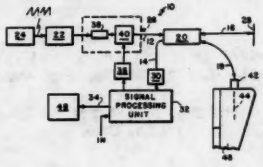
William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Continuation of Ser. No. 131,069, Dec. 10, 1987, Pat. No. 4,840,481. This application Feb. 13, 1989, Ser. No. 310,148

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[5] G01B *11/16*

U.S. Cl. 356—32 13 Claims



1. A method of composite integrity monitoring by sensing strain distributed along an optical fiber, comprising the steps of:

providing a composite structure, and an optical fiber, said structure comprising composite material, said optical fiber being embedded in said composite material, said optical fiber being subjected to strain;

launching initial frequency varying modulated optical energy having a selectively controllable polarization state into said optical fiber;

providing a reference signal representative of the modulated optical energy;

mixing a portion of the optical energy backscattered from the fiber with a portion of the reference signal to produce a beat signal, the frequency of which is representative of strain at a location along the fiber;

sensing the polarization state of the backscattered optical energy; and

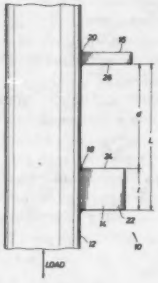
controlling the polarization state of said initial optical energy launched in response to said beat signal.

4,983,035

LASER MEASURING DEVICES

John V. Wright, Stafford; Thomas A. Rabson, and Michael D. Reifel, both of Houston, all of Tex., assignors to Reiton Ltd., Houston, Tex.

Filed Jun. 24, 1988, Ser. No. 211,275
Int. Cl.[5] G01B 11/16
U.S. Cl. 356—32 9 Claims



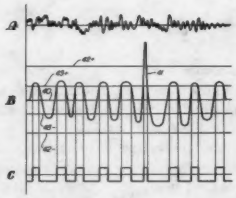
1. A strain gauge system, comprising:
(a) an elongate laser body formed of active material capable of lasing, said body forming a laser beam output;
(b) a reflective mirror cooperative with said laser body for directing laser beam reflections from said mirror through said body; and
(c) mounting means for joining said laser body and reflective mirror on a member subject to strain, said member during strain moving said body and reflective mirror proportional to strain such that laser beam output from said laser body encodes strain in the laser beam and wherein said mounting means maintains said laser body and said reflective mirror in a line parallel to the line in which strain is to be measured and further wherein said laser body and said reflective mirror form an extended cavity longer than the laser body.

4,983,036

SECURE IDENTIFICATION SYSTEM

Ronald W. Froelich, 2405 N. Cameron Ave., Covina, Calif. 91724

Filed Dec. 19, 1988, Ser. No. 286,214
Int. Cl.[5] G06K 9/20
U.S. Cl. 356—71 18 Claims



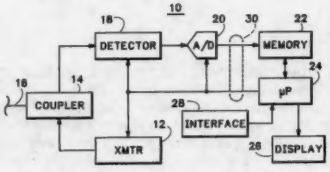
1. A system for identification of a person which comprises:
(a) a document bearing an exemplar body part print of a known person;
(b) means for projecting an optical image of a corresponding body part print of a person to be identified on said exemplar;
(c) means for moving said image with respect to said exemplar whereby during said motion the features of said image will come into coincidence with the corresponding features of said exemplar if said person to be identified is said known person;
(d) means for sensing the light reflected from said exemplar during said motion; and
(e) means for comparing the pattern of the variations in the amounts of light reflected from said exemplar during a portion of said motion with a previously determined pattern, said portion including a region where the features of said image and said exemplar are not in coincidence.

4,983,037

ESTIMATION OF FIBER LOSS AND RETURN SIGNAL POWER

Dean S. Messing, Aloha, and Ajay K. Luthra, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 5, 1989, Ser. No. 347,617
Int. Cl.[5] G01N 21/59, 21/84
U.S. Cl. 356—73.1 4 Claims



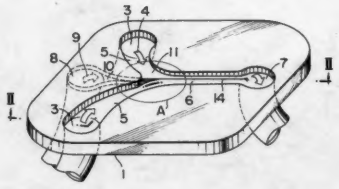
1. A method of determining fiber loss from a return signal from an optical fiber comprises the steps of:
fitting a polynomial to original, unlogged data samples of the return signal; and
computing an estimate of the fiber loss as a function of the coefficients of the polynomial.

4,983,038

SHEATH FLOW TYPE FLOW-CELL DEVICE

Hiroshi Ohki, Tsuchiura; Ryo Miyake; Isao Yamazaki, both of Ibaraki, and Fujiya Takahata, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,651
Claims priority, application Japan, Apr. 8, 1987, 62-84751
Int. Cl.[5] G01N 21/05
U.S. Cl. 356—246 18 Claims



1. A sheath flow type flow-cell device for a photo-particle-analyzer comprising:
a substantially flat top surface;
at least one first inlet for sheath fluid;
at least one first flow passage having a substantially rectangular cross-section and communicated with said at least one first inlet and contracted only in a widthwise direction of said flow-cell device toward a downstream portion to form a straight capillary flow passage having a substantially rectangular cross-section;

a discharge port provided at a terminal end of said straight capillary flow passage;

a second inlet for sample fluid; and

a second flow passage for said sample fluid communicated with said second inlet and contracted toward a downstream portion to be opened within said at least one first flow passage so as to keep a part of said at least one first flow passage above and below an opening of said second flow passage, said opening being faced in the same direction as said straight capillary flow passage.

4,983,039

SPECTROMETER

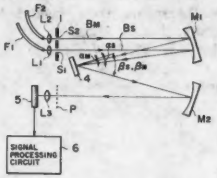
Tatsuo Harada, Fuchu; Toshiei Kurosaki, Kodaira; Toshiaki Kita, Tokyo, and Tsuneo Terasawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 370,034

Claims priority, application Japan, Jun. 24, 1988, 63-154697

Int. Cl.[5] G01J *3/18*

U.S. Cl. 356—328 **32 Claims**



1. A spectrometer, comprising:

a first entrance slit for passing a reference light beam therethrough;

a second entrance slit for passing a light beam to be measured therethrough;

a combination of a diffraction grating and a focusing optical system for reflecting and diffracting at least a spectral line of both the reference light beam passing through the first entrance slit and the light beam to be measured passing through the second entrance slit, to focus the spectral lines of the reflected and diffracted reference light beam and the reflected and diffracted light beam to be measured; and

linear image detection means for measuring the wavelength of the focused spectral line light beam to be measured by using the wavelength of the focused spectral line of the reference light beam as a standard.

4,983,040

LIGHT SCATTERING AND SPECTROSCOPIC DETECTOR

Benjamin Chu, Setauket, and Harbans S. Dhadwal, Westbury, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Nov. 4, 1988, Ser. No. 267,528

Int. Cl.[5] G01N *21/49*

U.S. Cl. 356—338 **31 Claims**

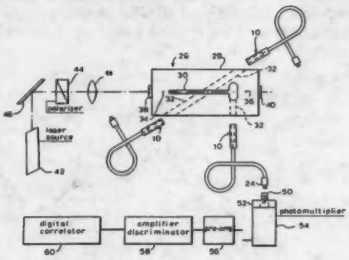
12. An apparatus for permitting spectroscopic and/or light scattering measurements, comprising;

a housing defining an elongated cavity therein, said cavity having a longitudinal axis;

means for allowing the passage of an incident light beam through said cavity;

a plurality of detector ports extending through said housing and adjoining said cavity, each of said ports extending at a different angle with respect to said axis; and

a probe positioned within one of said ports, said probe including an optical fiber and a graded index microlens



coupled to said optical fiber, said graded index microlens adjoining said cavity.

4,983,041

SPECTROSCOPIC APPARATUS FOR EXTREMELY FAINT LIGHT

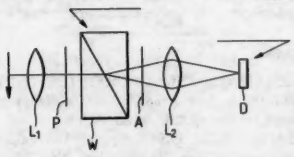
Fumio Inaba, 13-1, 1-chome, Yagiyamaminami, Sedai-shi, Miyagi-ken, Japan

Filed Oct. 25, 1988, Ser. No. 261,855

Claims priority, application Japan, Oct. 26, 1987, 62-268316

Int. Cl.[5] G01J *3/45*

U.S. Cl. 356—346 **8 Claims**



1. Fourier spectroscopic apparatus of a spatial interferogram type for extremely faint light comprising:

a first optical system dividing an extremely faint light from a photon emitting source into two different light beams;

a second optical system focusing interference fringes of the two different light beams; and

a detector detecting focused interference fringes, the detector is a two-dimensional photon counter capable of detecting photon receiving positions.

4,983,042

METHOD AND SYSTEM FOR MEASURING THE MICROSTRUCTURE OF SURFACES

Klaus Körner, and Holger Fritz, both of Berlin, German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Filed Feb. 1, 1989, Ser. No. 305,448

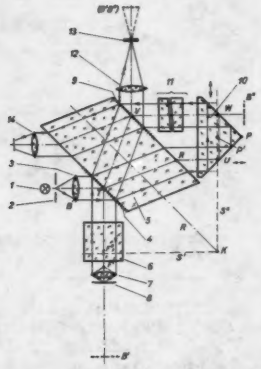
Claims priority, application German Democratic Rep., Feb. 10, 1988, 312815

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—359 **18 Claims**

1. A process for observing the microstructure of the surface of a test object, comprising, restricting the spatial angle of a monochromatic light beam, collimating said light beam, splitting said collimated light beam in an object beam and a reference beam, optically redirecting the object beam, passing the object beam through a lens for focussing the object beam onto the surface of the test object, reflecting the beam from said surface, collimating the reflected object beam, passing the reference beam through redirecting means for redirecting its

path, then passing said reference beam through reflector means for reversing the direction of the path of the reference beam and for redirecting said reference beam in a direction opposite to its direction prior to redirection, further redirecting said reference beam, recombining and focussing in a common beam the object beam and the reference beam, and forming an ob-



servable image, the image being an interference pattern of the surface of said object, observing the interference pattern, conjugating by optical redirection the virtual planes of reflections formed by the object beam and the reference beam, and zeroing for at least one wavelength the optical path differences between interfering object beams and reference beams.

4,983,043

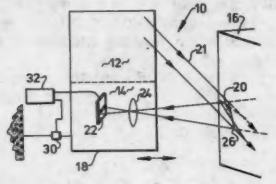
HIGH ACCURACY STRUCTURED LIGHT PROFILER

Kevin G. Harding, Ann Arbor, Mich., assignor to Industrial Technology Institute, Ann Arbor, Mich.

Continuation of Ser. No. 39,670, Apr. 17, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 289,486

Int. Cl.[5] G01B *11/24*

U.S. Cl. 356—376 **11 Claims**



1. An optical system for evaluating the surface shape of a workpiece along a cross section comprising:

illumination means for projecting a line or light onto said workpiece,

viewing means for imaging the intersection of said line of light and said workpiece surface onto a linear detector having a plurality of light sensitive regions when some portion of said workpiece surface is at a preselected range distance relative to said illumination means, each of said light sensitive regions being illuminated with light from portions of said line of light corresponding to each of said light sensitive regions only when said portion of said workpiece surface is intersected by said corresponding portion of said line of light at said preselected range distance, said light sensitive regions not being illuminated when said workpiece surface portion is outside said preselected range distance,

translation means for moving said line of light and the focus of said viewing means with respect to said workpiece along said cross section, and

signal processing means for receiving a signal from said detector related to said regions of said detector which are illuminated and for recording said signals at a plurality of different positions of said translation means whereby the relationship between said signals and said translation means position characterizes said surface shape.

4,983,044

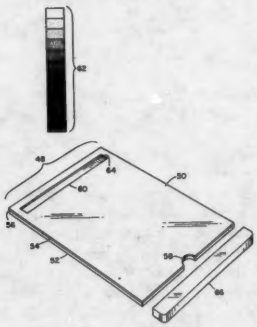
QUANTITATIVE ANALYSIS OF BIOLOGICAL MATERIALS AND PHOTOGRTAPHIC FILM AND APPARATUS THEREFOR

Miriam Schweber, Lexington, Mass., assignor to The Trustees of Boston University, Boston, Mass.

Filed Mar. 31, 1987, Ser. No. 32,743

Int. Cl.[5] G01N *21/59*

U.S. Cl. 356—443 **8 Claims**



8. A method of assuring linearity of densitometric measurements of DNA relative to exposure of a film, comprising the steps of:

a. isolating DNA from a sample;

b. treating isolated DNA to produce DNA fragments;

c. spatially orienting fragments according to size;

d. radioactively identifying DNA fragments by hybridization with a specific, radioactively-labeled probe comprising a nucleic acid sequence homologous to the nucleic acid sequence of the DNA fragments of interest;

e. providing a film having a density reference image on a limited region, the reference having a range of densities;

f. exposing a region of the film separate from the limited region of the radioactively-identified, spatially-oriented DNA fragments, to form an image on the film;

g. developing the film;

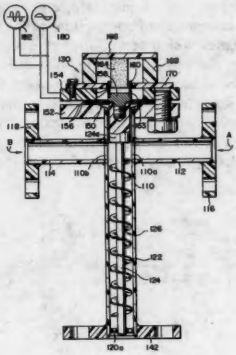
h. performing a densitometric tracing of the densitometric reference image and of the image formed by exposure to the spatially-oriented, radioactively-identified DNA fragments; and

i. determining whether the densitometric tracing produced by exposure to the DNA fragments lies within the linear range of response of the film, as defined by the densitometric tracing of the reference image.

4,983,045
MIXER

Toru Taniguchi, Tokyo, Japan, assignor to Reica Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 931,679, Nov. 17, 1986, abandoned. This application Oct. 28, 1988, Ser. No. 264,434
Claims priority, application Japan, Nov. 22, 1985, 60-264152; May 1, 1986, 61-102393; May 28, 1986, 61-81578; Aug. 12, 1986, 61-190009; Aug. 3, 1988, 63-195151
Int. Cl.[5] B01F *11/00*
U.S. Cl. 366—117 **4 Claims**



1. A mixer comprising duct means for receiving a plurality of different fluids, stirrer means disposed within said duct means, said stirrer means including a stirrer shaft and stirring vane means rigidly mounted on said stirrer shaft to form a plurality of spaces along the length of said stirrer shaft, said stirrer vane means being adapted to stir and mix the fluids inducted in to said duct means, said stirrer vane means including openings means through which the fluids can move, said stirring vane means further comprising a spiral screw-shaped vane having openings which are formed in and spaced away from one another along at least one of the inner and outer marginal edges of said spiral vane at circumferential different positions, and vibrator means for vibrating said stirrer means within said duct means, whereby the fluids can be stirred and mixed together while moving from one space in the stirring vane means to another through the corresponding opening means during vibration of said stirrer means.

4,983,046
MIXER

Hiroshi Murata, Kawagoe, and Masayuki Yasuguchi, Sagamihara, both of Japan, assignors to Nisshin Flour Milling Co., Ltd. and Nisshin Engineering Co., Ltd., both of Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 239,210
Claims priority, application Japan, Sep. 4, 1987, 62-221248; Sep. 4, 1987, 62-221249
Int. Cl.[5] B01F *7/28*
U.S. Cl. 366—312 **18 Claims**

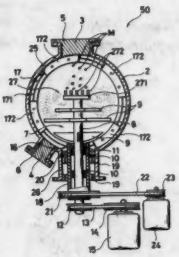
12. A mixer, comprising:

a mixer main body, said mixer main body including a casing provided with inlet and discharge ports for materials and a spherical inner space having an inner wall;

cracking and dispersing means provided in said vicinity of said inlet port for cracking and dispersing materials charged at said inlet port before mixing of said materials;

agitator means for agitating and mixing said charged materials;

scraping means for scraping off materials deposited on said inner wall of said casing, said scraping means including a scraper revolvable along all of said inner wall of said casing, and means for rotatably driving said scraper; and

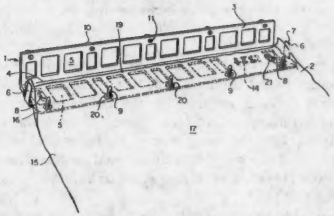


angle setting means for tilting said main body of said mixer to a predetermined angle to improve mixing of materials in said mixer main body.

4,983,047
ENVELOPE WITH CLOSURE AND SEAL DEVICE

Eduardo D. L. C. Netto, Rua Sao Luiz Gonzoga, 912, 20910 Rio de Janeiro, Brazil

Continuation-in-part of Ser. No. 268,985, Nov. 9, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 429,124
Claims priority, application Brazil, Nov. 26, 1987, PI8706409
Int. Cl.[5] B65D *33/34*
U.S. Cl. 383—5 **13 Claims**



1. Envelope with closure and seal device comprising an envelope having first and second opposite planar sides and a transverse opening adjacent one end, and a closure and seal device having a first part extended substantially along said opening externally of said first side, said first part being formed with a series of upstanding locking pins distributed therealong, each pin passing through a corresponding pair of orifices, one in each said side of the envelope, the closure and seal device also having a second part formed with a corresponding series of locking socket formations for said pins, said second part being adapted to be placed externally of said second side of said envelope and substantially along said openings for receiving and locking said pins in a closed and sealed configuration of the envelope, means also being extended along the whole length of, and folded over said opening in said configuration and maintained in such position by the locking of said pins in said socket formation, each said socket formation including internal locking teeth co-operable behind a head formed on a corresponding one of said pins and having an outer part which, in said closed and sealed configuration, has an axial opening substantially filled by said head whereby there is no access to said teeth from the outside in said closed and sealed configuration.

4,983,048

BALL CIRCULATION BUSH FOR A LINEAR BALL GUIDE

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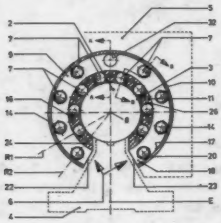
Filed Apr. 5, 1990, Ser. No. 505,023

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911500

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—43 17 Claims



1. A ball circulation bush with a longitudinal slot, which embraces a guiding rail and has an at least partially circular cross-section interrupted by said longitudinal slot (6), comprising several continuous rows of balls distributed along the cross-section and guided in a cage, which rows each include a carrying portion which extends parallel to the longitudinal axes of the bush and guiding rail and in which the balls project from the cage while resting against the guiding rail, a returning portion, and deflecting portions connecting the carrying portion and the returning portion at their ends, the balls in the carrying portion being supported on bush races,

the bush (9) being a solid bush having an inner face (16) which serves as a race for the balls (12) contained in the carrying portions (13),

the carrying portions (13) and returning portions (14) being arranged in radial planes (R1, R2) circumferentially offset relative to each other, with the returning portions (14) being arranged on a larger diameter than the carrying portions (13), and being formed by bores (21) in the bush (9), the ball rows (7) being distributed so that the returning portions (14) are directly adjacent to limiting faces (22, 23) of the slot (6),

the cage (11) having several parts, including two identical guiding parts (24, 24*a*) inserted into the bush (9) from its two ends, which laterally guide the balls (12) in the carrying portions (13) and have radially inwardly and outwardly open longitudinal slots (25) and a flange (30) with a first portion (37) of the deflecting portions (15) for transferring the balls (12) into the returning portions (14) and head pieces (34, 34*a*) attached at head ends of the two guiding parts and comprising a second portion (38) of the deflecting portions (15), and further comprising means (28, 29; 31, 32; 33, 35) for centering the two guiding parts (24, 24*a*) and the head pieces (34, 34*a*) relative to each other and to the bush (9).

4,983,049

LINEAR PRECISION GUIDE

Marc Lecomte, 9, rue Plaisance, F-33700 Merignac, France

Filed Jan. 25, 1990, Ser. No. 469,962

Claims priority, application France, Jan. 25, 1989, 89 01092

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—45 31 Claims

1. A linear precision guide comprising

a frame;

a guide rail having a prismatic shape;

grooves serving as a race;

channels serving as a race;

a slide block including movable balls supported on the grooves and channels;

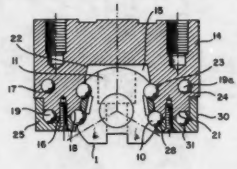
wherein the guide rail is inscribed in a circle and presents at least three circular portions of arcs having extremities and permitting the support of cutting or precision-grinding machine tool jaws;

a lower plane side-face intended, after precision-grinding, to rest on the frame, and wherein successive extremities of two of the arcs are connected by said plane side;

sets of movable balls;

a block;

two recessed plane sides for connecting opposite extremities of the two arcs with a third arc, and wherein the two plane sides comprise end connections in the form of circular rail recesses which serve, after precision grinding, as the race for the sets of movable balls maintained on the block; a central block groove disposed on the block containing the guide rail; wings attached to the block having a lower inner end part and an upper inner end part, wherein one lower set of balls is supported in a lower circular housing groove disposed in the lower inner end



part of each of the wings, and an intermediary set of balls is supported in the circular intermediary block groove between the lower inner end part and the upper inner end part of each wing;

ducts, wherein one duct, formed as a circular groove, is provided in the lower inner end part of the wings for the lower set of balls, and wherein another duct is provided by a borehole duct furnished in each of the wings for the intermediary set of balls, and wherein the races formed by the lower housing groove and intermediary block groove are connected to the ducts and permit a continuous recirculation of the two sets of balls during displacement of the block;

wherein the connection of the lower housing groove and the intermediary block groove with the ducts is furnished by an inner circular housing groove for a lower set of balls and by an end-part channel for an intermediary set of balls, said grooves being fashioned in the end parts of the block;

a single block housing fixed under each wing of the block for supporting the two sets of balls on the lower circular housing groove and on the circular intermediary block groove, respectively.

4,983,050

BEARING SUPPORTING ARRANGEMENT

Masahiro Aida, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Jun. 2, 1989, Ser. No. 360,794

Claims priority, application Japan, Jun. 7, 1988, 63-138503

Int. Cl.[5] F16C *23/08, 33/66*

U.S. Cl. 384—99 7 Claims

1. A bearing supporting arrangement for a turbocharger having a turbine shaft, comprising:

a bearing housing defining a bore thereinside,

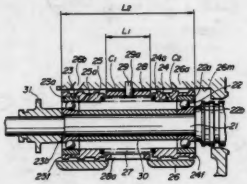
first and second generally cylindrical oil film damper members located separate from each other with a distance (L_2) separating their respective axially outside faces, each of said first and second oil film damper members being separated from a surface of said bearing housing bore to define

therebetween a second clearance (C_2) which is filled with a lubricating oil;

first and second rolling bearings which are separate from each other and are coaxially fixedly secured respectively to said first and second oil film damper members;

a compression coil spring disposed between axially inside end faces of said first and second oil film damper members;

a generally cylindrical thrust receiving member of a length (L_1) smaller than said distance separating said axially outside end faces (L_2), interposed between the axially inside end faces of said first and second oil film damper members and extending generally in an axial direction of said bearing housing bore, the outer peripheral surface of said thrust receiving member being separated from the



adjacent surface of said bearing housing bore to define therebetween a first clearance (C_1);

a fixing pin secured to said bearing housing and engaged with with an axially intermediate portion of a cylindrical wall of said thrust receiving member so that said thrust receiving member is slightly movable in a direction generally perpendicular to the axis of said bearing housing bore to be contactable with the surface of said bearing housing bore,

a first ratio (C_1/L_1), of said first clearance (C_1) realative to said axial length (L_1) of said thrust receiving member being selected to be smaller than a ratio (C_2/L_2) of said second clearance relative to said distance (L_2) separating said outside axial end faces.

4,983,051

APPARATUS FOR SUPPORTING A ROTATING SHAFT IN A ROTARY MACHINE

David H. Hibner, Colchester; Dennis F. Buono, Manchester; Kurt M. Dembeck, Vernon, and Roy D. Franceschet, North Haven, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 193,449, May 12, 1988, Pat. No. 4,947,639. This application Apr. 11, 1990, Ser. No. 507,950

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—99 **5 Claims**

1. A rotary machine which includes a rotor shaft and support structure for the shaft, the rotor shaft being rotatable at a first speed and a second speed, which comprises:

an adjacent support structure which is spaced radially from the shaft;

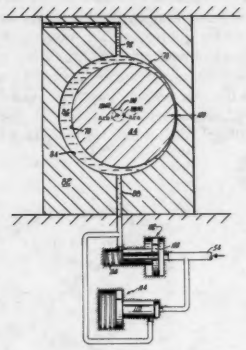
a member disposed about the shaft which is adapted to rotatably support the rotor shaft and which is spaced from the adjacent support structure leaving a damping chamber that is circumferentially continuous and that is disposed circumferentially about the member for damping vibrations in the shaft therebetween;

means for flexibly supporting the member from the adjacent support structure which permits vibrational movement of the shaft in response to rotation of shaft;

means for disposing damping medium in said damping chamber at said first rotational speed of the rotor shaft to provide a viscous damper for damping vibrational movement of the rotor shaft, and for removing damping medium from said damping chamber at said second rotational speed of the shaft to remove the viscous damper from the rotary machine at said second speed; and

wherein the rotary machine further includes a stator assembly and wherein the adjacent support structure is a portion of the stator assembly; and

wherein the member is a nonrotating inner housing, wherein the rotary machine further includes a bearing disposed



between the inner housing and the rotor shaft, wherein the adjacent support structure includes an outer housing spaced radially from the inner housing leaving therebetween an annular damping chamber.

4,983,052

ADJUSTING VERTICAL LINE LENGTH IN FRAME PRINTER

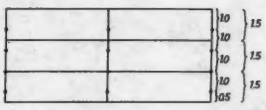
Akemi Nagatsuna, and Noriaki Kabeya, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 31, 1989, Ser. No. 330,908

Claims priority, application Japan, Apr. 6, 1988, 63-84935

Int. Cl.[5] B41J *29/26*

U.S. Cl. 400—17 **8 Claims**



1. A typewriter with a keyboard including a frame print key for printing a frame on a sheet by printing horizontal lines at a fixed distance and vertical lines at present positions, using a printing head including printing types of a unit horizontal-line and a unit vertical-line, and a movement mechanism for effecting relative horizontal and vertical movements respectively equal to the lengths of the unit horizontal-line and the unit vertical-line between the printing head the sheet, the printer comprising:

memory means for storing externally input format data of the frame including data of the vertical line positions, data of the fixed distance, and data of the number of rows in the frame;

means for printing the horizontal lines using the horizontal-line printing type and the movement mechanism according to the stored fixed-distance data; and

vertical line printing means including:

a determination/calculation means for determining based on the data stored in the memory means according to pressing of the frame print key whether a distance from a starting point of the vertical-line to the horizontal-line contacting at a final portion of the vertical-line is an integer multiple of the unit vertical-line length and for calculating a mismatch amount smaller than the unit vertical-

line length when the distance is not the integer multiple of the unit vertical-line; and

control means for controlling the movement mechanism so that the printing head prints a vertical line to have a length equal to the integer multiple of the unit vertical-line length when the determination/calculation means determines the distance to be an integer multiple of the unit vertical-line length, and for controlling the movement mechanism so that the printing head prints a vertical line to have a length equal to an integer multiple of the unit vertical-line length as well as the mismatch amount when the determination/-calculation means determines that the distance is not an integer multiple of the unit vertical-line length.

4,983,053

PASSBOOK PRINTING MACHINE

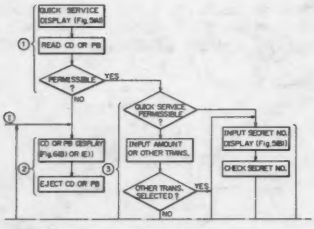
Setsuo Tsukui, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 240,482, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 5,794, Jan. 27, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 483,331

Claims priority, application Japan, Jan. 22, 1986, 61-011668

Int. Cl.[5] B41J *5/30*

U.S. Cl. 400—62 **11 Claims**



1. A passbook printing machine used for automatic transactions in the field of banking which executes a transaction by user manipulation with the use of a passbook which is inserted into the machine immediately before the transaction and which is returned to the user after transaction data is printed therein, the machine comprising:

a printer for printing said transaction data in said passbook in a brief printing mode or in an ordinary printing mode;

said printer printing only a latest transaction data in said passbook in said brief printing mode, and said printer printing not-printed former transaction data in addition to said latest transaction data in said ordinary printing mode, one of said printing modes being selectively executed in response to a single user manipulation,

means coupled to the printer for storing not-printed transaction data, reading the not-printed transaction data, and producing transaction data of a transaction performed using said passbook;

mode input means coupled to the storing, reading and producing means for selecting either the brief printing mode or ordinary printing mode, and

means for judging the selected mode to switch the transaction data to be fed to the printer.

4,983,054

DATA LATCHING FOR PREHEAT AND PRINT CONTROL IN A THERMAL PRINTER

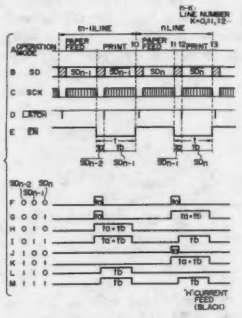
Masaaki Nishiura, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1988, Ser. No. 285,417

Claims priority, application Japan, Dec. 18, 1987, 62-320407

Int. Cl.[5] B41J *2/38, 2/355*

U.S. Cl. 400—120 **16 Claims**



1. A thermal printer for printing previous and present print data during previous and present print periods, respectively, comprising:

buffer means for storing print data;

heating resistor means for generating heat to color a thermosensitive paper when current is fed to said heating resistor means during the present period;

data output means for outputting, during the previous period, the inverse of the print data from the previous print period, and for outputting the present print data stored in said buffer means, after the previous print period and before the present print period;

data storing means for storing first the inverse data and then the present print data output from said data output means;

latch means for latching data stored in said data storing means;

latch control means for latching in said latch means the inverse data stored in said data storing means after the previous print period and before the present print period, and for latching the present print data stored in said data storing means in the middle of the present print period; and

current feed means for feeding current to said heating resistor means during the present print period, first in accordance with the inverse data and then in accordance with the print data latched in said latch means.

4,983,055

TYPE WHEEL SUPPORTING STRUCTURE

Nobuo Iwata, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 857,124, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 581,276, Feb. 17, 1984, abandoned. This application Jul. 7, 1988, Ser. No. 219,837

Claims priority, application Japan, Feb. 23, 1983, 58-27715; Feb. 26, 1983, 58-43514; Mar. 26, 1983, 58-43515

Int. Cl.[5] B41J *1/30*

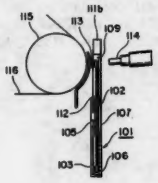
U.S. Cl. 400—144.2 **29 Claims**

1. A cassette housing a type wheel having a central hub which is provided with (i) drive engaging means, (ii) a front projection means, and (iii) a rear projection means, said cassette being detachably mountable at a printing position in a printing machine which has a selection motor means and said type wheel further having a plurality of spokes extending

radially from the central hub thereof and types provided at the free ends of at least some of the spokes, said cassette comprising:

a rear wall having a hub opening shaped and dimensioned to (i) allow the drive engaging means of the central hub of the type wheel to be drivingly engaged by a selection motor means and (ii) loosely receive said rear projection means of the central hub of the type wheel;

a front wall connected to the rear wall at least partly to form an integral structure therewith within which the print wheel can rotate, wherein said front wall is spaced forwardly from the rear wall to allow space for positioning



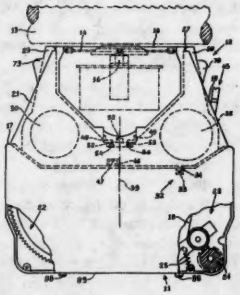
the type wheel between said front and rear walls of the cassette, wherein said front wall has a hub opening which is opposite the hub opening in the rear wall and loosely receives said front projection means of the central hub of the type wheel, wherein said cassette is free of cassette-mounted spring means acting on the type wheel and wherein the spacing between the front and rear walls of the cassette relative to the axial distance between the hub's front and rear projection means is such that at any time at least one of the front and rear projection means is received in the respective hub opening of the respective wall to limit radial movement of the type wheel relative to the cassette.

4,983,056

CONNECTABLE CARTRIDGES FOR COMPATIBLE TYPING AND CORRECTION RIBBONS

Remo Falconieri, S. Giorgio C.se, and Sergio Uggetti, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 15, 1989, Ser. No. 310,687
Claims priority, application Italy, Feb. 22, 1988, 67132 A/88
Int. Cl.[5] B41J *35/28, 29/36*
U.S. Cl. 400—208 **19 Claims**



1. A typing ribbon cartridge for a typewriter, provided to form a unitary typing and correcting cartridge with a correcting cartridge to be mounted as a unit in the typewriter, in which said correcting cartridge comprises a correcting ribbon container, a correcting ribbon lodged in said correcting ribbon container, complementary alignment means, complementary engagement means, and a coupling member of a first kind projecting from the correcting ribbon container, said typing ribbon cartridge comprising

a typing ribbon container for lodging a typing ribbon and providing an external portion of the typing ribbon to span externally to said typing ribbon container, and wherein said typing ribbon is compatible with a correcting ribbon of a first kind;

reference alignment means engageable with said complementary alignment means for defining a pre-set relationship of the correcting ribbon container with respect to said typing ribbon cartridge;

reference engagement means for cooperating with said complementary engagement means to fix a correcting cartridge of a first kind with said typing ribbon cartridge in said pre-set relationship to form said unitary typing and correcting cartridge; and

coupling means for preventing the typing ribbon cartridge from forming a unitary typing and correcting cartridge with a correcting cartridge different from the first kind of correcting cartridge before the mounting of said typing ribbon cartridge in the typewriter, said correcting cartridge different from the first kind of correcting cartridge comprising a correcting ribbon container, complementary alignment means and complementary engagement means functionally identical to the correcting ribbon container, the complementary alignment means and the complementary engagement means of the first kind of correcting cartridge, respectively, but a correcting ribbon different from the first kind of correcting ribbon and a coupling member different from said first kind of coupling member, said coupling means comprising seat means and strip means in said typing ribbon container;

wherein said seat means are provided for lodging said first kind of coupling member in the pre-set relationship of the first kind of correcting cartridge in order to permit said complementary engagement means to cooperate with said reference engagement means and fix the first kind of correcting cartridge to said typing ribbon cartridge; and

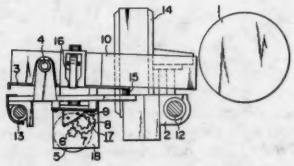
wherein said strip means are provided to arrest the coupling member different from the first kind of coupling member for preventing the reference engagement means from cooperating with said complementary engagement means to form said unitary typing and correcting cartridge, when the correcting ribbon container contains a correcting ribbon different from said first kind of correcting ribbon.

4,983,057

RIBBON POSITION SELECTING DEVICE FOR PRINTER

Sigemi Akiyama, and Hidekazu Ishii, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,314
Claims priority, application Japan, May 27, 1985, 60-113389
Int. Cl.[5] B41J *35/14*
U.S. Cl. 400—216.2 **4 Claims**



1. A printer comprising:

(a) a platen having a printing position;

(b) a carrier;

(c) a printing unit mounted on said carrier;

(d) a ribbon base mounted on said carrier in such a manner as

to be vertically movable in a direction perpendicular to said platen;

(e) a ribbon cassette for a multi-color ribbon having a plurality of differently colored, vertically spaced zones detachably mounted on said ribbon base;

(f) a stopper mounted on said carrier and adapted to come into abutment against said ribbon base to locate said ribbon cassette at a reference position;

(g) a step motor mounted on said carrier;

(h) a power transmitting mechanism for receiving rotation of said step motor and vertically moving said ribbon base;

(i) said step motor being sized so that it requires a plurality of steps to move said ribbon base so that a different one of said zones is in opposed relation to the printing position of said platen;

(j) a torque limiter provided in said power transmitting mechanism and adapted to be slipped with a torque smaller than the pull-out torque of said step motor; and

(k) a one-way clutch provided in said power transmitting mechanism for transmitting rotation of said step motor in the direction such that said ribbon base is driven to separate from said reference position,

whereby:

(l) when said ribbon base is brought into abutment against said stopper during rotation of said step motor, causing said ribbon cassette to be located at its reference position, said step motor continues to operate without step out due to the fact that said torque limiter and said one-way clutch are slipped in said power transmitting mechanism; and

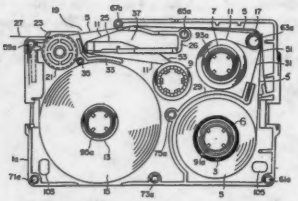
(m) when said ribbon cassette is driven to separate from its reference position, the power of said step motor is securely transmitted to said ribbon base by said one-way clutch irrespective of large frictional resistance during transmission of the power and the phase of said step motor at stopping of the operation is kept at a specified phase, thereby permitting the position of said ribbon cassette with respect to the printing position of said platen to be accurately set by driving said step motor on the basis of this phase, permitting accurate use of the number of steps corresponding to the desired quantity of movement of said ribbon base, and preventing mixing of the colors.

4,983,058

TAPE HOLDING CASE

Tuyoshi Nagae, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 16, 1989, Ser. No. 422,010
Claims priority, application Japan, Oct. 17, 1988, 63-135275
Int. Cl.[5] B41J *35/36*
U.S. Cl. 400—249 **15 Claims**



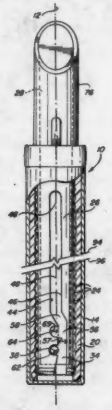
1. A tape holding case adapted to be attachably and detachably mounted on a tape feed device having a roller member, said tape holding case including at least two tapes, means to bring said tapes into contact with each other at a predetermined position within said tape holding case; means to subsequently separate said tapes and feed one of said tapes outside of the tape holding case through said roller member provided on said tape feed device and another roller member provided within said tape holding case; means to wind the other of said two tapes onto said another roller member after said two tapes are contacted, and subsequently separated said one of said two tapes including a visually distinguishable predetermined portion at a trailing side arranged to be fed to the outside of said tape holding case before the whole of the other of said two tapes is taken up onto said another roller member.

4,983,059

DISPENSER FOR COSMETIC PREPARATIONS

Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Jul. 18, 1989, Ser. No. 381,582
Int. Cl.[5] A45D *40/12, 40/06*
U.S. Cl. 401—78 **7 Claims**



1. A cosmetic dispenser, comprising:

a tubular base having upper and lower ends and an axis, and a internal spiral thread extending along a substantial length of said base;

a tubular inner body having upper and lower ends and a wall, said inner body being fitted into said tubular base, said inner body being provided with a track extending through the wall of said inner body along a substantial length of said inner body, said track comprising

an upper straight track portion having an axis, and

a lower offset track portion having an axis offset from the axis of said upper straight track portion, said lower offset track portion having at least one notch connecting with an extending laterally from said offset track portion to a location beneath and substantially in alignment with said axis of said upper straight track portion;

means for retaining said inner body and said base together while permitting rotation of either said inner body or base relative to the other;

an elevator cup for receiving a cosmetic material, said elevator cup being fitted inside said inner body, said elevator cup being provided with a radially outwardly extending lug, said lug being sized to fit into and engaging said track of said inner body and said spiral thread of said base for axial movement of said elevator cup by relative rotation of said base and inner body, said lug being engageable with said at least one notch to lock said elevator cup in place;

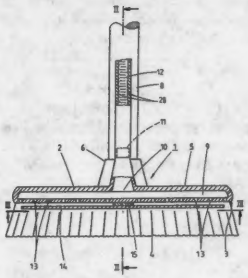
a tubular nose piece secured to said upper end of said inner body, said nose piece having a dispensing opening at an upper end thereof which is non-perpendicular to the axis of said base.

4,983,060

APPLIANCE FOR THE TREATMENT OF TEXTILE FLOOR COVERINGS

Gerhard Steinbach, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 16, 1989, Ser. No. 394,616
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827781; Feb. 24, 1989, 3905760
Int. Cl.[5] A47L *13/26;* A46B *11/06, 9/02*
U.S. Cl. 401—140 6 Claims



1. An appliance for treating textile floor coverings with a foaming cleaning liquid, comprising a shaft-like handle with a bristled cleaning element attached thereto, a container for cleaning liquid replaceably mounted on said handle by means of a holding element, and a hose for connecting said container and said cleaning element which is operatively connected to a dosing mechanism regulating the outflow of cleaning liquid from said container, said hose having a grooved internal profile, said cleaning element comprising a hollow or manifold brush having a handle socket and an inlet nozzle on its top surface for said hose at a level even with said socket for fixing said handle to said cleaning element, said cleaning element having outlet holes in the underside surface of said manifold, rows of bristles arranged at the outer edges of the underside surface of said manifold, and an imperforate distributor plate spaced from and covering the underside surface of said manifold brush which is not provided with bristles.

4,983,061

FLUID APPLICATOR APPARATUS

Scott W. Demarest, Caledonia Township, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 369,434, Jun. 19, 1989, abandoned.
This application Jul. 26, 1990, Ser. No. 559,440
Int. Cl.[5] A47L *13/17;* A01M *3/00*
U.S. Cl. 401—148 10 Claims

1. A fluid applicator apparatus comprising:

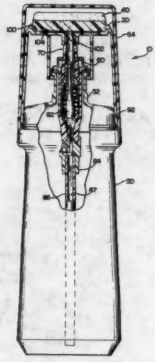
a fluid reservoir designed to hold fluid to be applied to a surface, the fluid reservoir having a neck opening at one end;

a fluid applicator means designed to apply fluid to the surface; and

fluid transfer means for effecting a metered transfer of the fluid from the fluid reservoir to said fluid applicator means, the fluid transfer means being located upon and within the neck opening of the fluid reservoir, the fluid applicator means when being utilized to apply liquid to the surface being in fluid communication with the fluid transfer means;

the fluid transfer means further comprising an extensible and retractable spring-biased discharge means having a first and second fluid inlet and, spaced from both first and second fluid inlets, a fluid outlet, the first fluid inlet being located adjacent to the fluid discharge means and the second fluid inlet being located toward the distal end of a hollow tube member attached to and in fluid communication with the fluid discharge means;

the fluid applicator means further comprising in apertured applicator cap, having located on its outer surface a dispersing means, the aperture of the applicator cap being



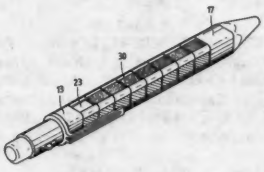
designed to receive the fluid outlet of the fluid discharge means, the applicator cap being moveable relating to the fluid reservoir in such a way that a predetermine force imposed on the applicator cap causes the fluid discharge means to be retracted and then extended, which in turn causes fluid to be transferred from the fluid reservoir to the dispersing means.

4,983,062

PEN HOLDER WITH PUZZLE BLOCKS

Jenn-Chyan Hour, No. 42, Sec. 2 Da-Feng Road, Tantzu Hsiang, Taichung Hsien, Taiwan

Filed Apr. 23, 1990, Ser. No. 513,226
Int. Cl.[5] A43K *29/00;* A63F *9/08*
U.S. Cl. 401—195 8 Claims



1. A pen holder with puzzle blocks, wherein the pen holder is of the type including a cap socket having a neck portion and a push head, a nib socket having a nib and spring, and a stem portion, the improvement comprising:

(a) the stem portion including a hollow stem body provided with a top end defined by a split open head and a flange, and a lower end defined by an expanded hollow neck portion, the top end being flexibly retained with the neck portion of the cap socket and the lower end being connected with the nib socket;

(b) a plurality of blocks, each block being provided with an identical axial hole therethrough and a plurality of grooves on a plurality of exterior faces thereof, the blocks being rotatably assembled on the stem body;

(c) a plurality of sliding pieces, each sliding piece being provided with a distinguishing feature on an upper face thereof and being slidably secured within a corresponding

groove of each block, with a single groove being unoccupied by a sliding piece; and

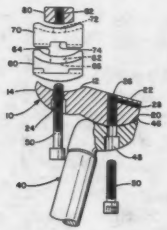
(d) wherein an adjacent sliding piece may be slid into the unoccupied groove to define a new unoccupied groove which may be filled by another adjacent sliding piece and the blocks may be rotated relative to each other for aligning sliding pieces with the same distinguishing features together.

4,983,063

BICYCLE SEAT ADAPTER

Terry J. Phillips, 12842 Morning Glory Tr., Chesterland, Ohio 44026

Filed Apr. 12, 1990, Ser. No. 508,911
Int. Cl.[5] F16B *1/00*; F16D *1/00*
U.S. Cl. 403—4 **14 Claims**



1. A bicycle seat adapter comprising:

an elongated block having at least a first surface and a second surface offset axially along the direction of elongation,

said first surface comprising a recessed area capable of receiving a clamp assembly from a bicycle

said second surface comprising a convex area capable of interfacing with a corresponding concave surface of a bicycle seat post,

a means for securing said clamp assembly to said seat adapter,

a means for securing said seat adapter to said bicycle seat post.

4,983,064

METAL CERAMIC FITTING ASSEMBLY

Yasunobu Kawaguchi, Tokyo; Toshiaki Muto, and Tatsuo Ichinokawa, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 811,160, Dec. 19, 1985, Pat. No. 4,747,722.
This application Apr. 15, 1988, Ser. No. 181,839
Claims priority, application Japan, Dec. 19, 1984, 59-191479[U]; Dec. 22, 1984, 59-194618[U]
Int. Cl.[5] F16B *4/00*
U.S. Cl. 403—30 **9 Claims**

1. A method for forming a fitting assembly including a first member having a boss with a leading end and formed of a first material for attachment to an end of a second member formed of a second material, said second material having a coefficient of thermal expansion greater than that of said first material, comprising the steps of:

forming said second member with a cup-shaped element having a base and an open end;

heating said cup-shaped element and controlling the thermal expansion thereof so that said element undergoes greater thermal expansion in the radial direction adjacent said base than adjacent said open end;

inserting said boss into said cup-shaped element to place the leading end of said boss in close relation with respect to said base; and

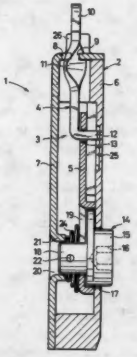
gradually cooling said element so that it shrinks and compresses said boss to an increasing degree progressively toward said leading end thereof.

4,983,065

CONNECTING ELEMENT

Werner F. Späth, Wutöschingen-Horheim, Fed. Rep. of Germany, assignor to Exibelco GmbH, Allschwil, Switzerland

Filed May 26, 1989, Ser. No. 357,163
Int. Cl.[5] F16B *9/02*
U.S. Cl. 403—252 **11 Claims**



1. A connecting element (1) for detachably connecting two frame components, particularly a support profile and a frame profile, the connecting element (1) being positioned in a stationary manner in the frame profile and constructed with a hollow profile, said connecting element having a casing (2) with at least one retaining element (3) therein and being connected with the support profile in a detachable manner, an eccentric cam (14) being positioned within the casing in a pivotable manner, said eccentric cam having at least one eccentric head (15), one eccentric cam disk and one support stud (18), said retaining element (3) being actuated in a longitudinally movable manner in the casing (2) by said eccentric cam, in which a component of the retaining element (3) projecting out of a frontal side of the casing (2) can be brought into contact with an undercut longitudinal groove of the support profile, said eccentric head (15) of the eccentric cam (14) being axially movable into the casing (2) against a spring (24), a safety mechanism preventing axial movement of the eccentric cam (14) during the longitudinal actuation of the retaining element (3), wherein said safety mechanism comprises a projection (22) provided on on the support stud (18) of the eccentric cam (14), and a recess (23) provided in the casing (2), whereby the projection (22) and the recess (23) are aligned with one another in such a manner that the projection (22) may be pressed into the recess, and thereby permitting axial movement of the eccentric cam (14), and when the projection and the recess are misaligned, the eccentric cam is thereby pre-

vented from axial movement during the longitudinal actuation of the retaining element.

4,983,066

FORM-FITTED CONNECTION BETWEEN TWO SHEET METAL ELEMENTS OF A VEHICLE AND METHOD FOR ITS MANUFACTURE

Karin Becker, Rockenhausen; Dieter Braun, Braunschweig, and Gerd Edel, Pirmasens, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,357

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817079

Int. Cl.[5] F16B *5/04*

U.S. Cl. 403—274 5 Claims

1. A form fitted connection for the transfer of moments of torque between two sheet metal elements of a vehicle, one of said elements having a flat shape and the other of said elements having a cylindrical shape in an area of said connection, particularly for a seat of a motor vehicle, in which the two elements are brought into contact along their edge zones, and the edge zones of one element has teeth that are spaced from each other and engage in tooth gaps of the edge zone of the other element, wherein:

said element having a flat shape is provided with a circular opening having a border which has a diameter smaller than an inside diameter of said cylindrically shaped element

the border of the opening of the flat shaped element is formed by tongues and teeth, which tongues are bent at right angles to form a cylindrical surface for centering an outer surface of the cylindrically-shaped element;

said cylindrically-shaped element is provided, at the end of said element to be connected with said flat shaped element, with teeth and tooth gaps formed by outwardly bent tongues, which tongues contact a flat surface of said flat shaped element and locate the axial position of the cylindrically-shaped element relative to the flat surface of the flat shaped element;

both of said elements have, in the area of their edge zones, tooth gaps formed by respective bent tongues between any two adjacent teeth, and one of the teeth of the respective opposed element engages in each of said tooth gaps of said element; and wherein

at least on the one of the two elements to be secured against sliding in the longitudinal direction of its teeth relative to the other element, at least one of the teeth of said one element is bent in the same direction as its adjacent tongues into a position where it engages behind the other element; and

at least some of the teeth of the cylindrically-shaped element are bent outwardly so that they contact one flat surface of the flat shaped element and the tongues of the cylindrically-shaped element contact the opposed flat surface of the flat shaped element; and

at least some of the teeth of the flat shaped element are bent at a right angle so that they contact an inner surface of the cylindrically-shaped element.

4,983,067

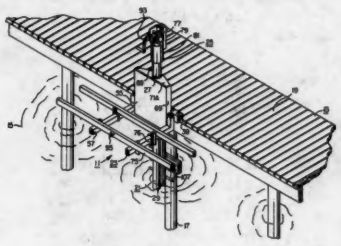
BOAT LIFT APPARATUS

David M. Montgomery, 8912 Crestwood Dr., Fort Worth, Tex. 76179

Filed Mar. 8, 1990, Ser. No. 490,484

Int. Cl.[5] B63C *3/06*

U.S. Cl. 405—3 21 Claims



1. A lift apparatus, comprising:

(a) an elongated load member having track means extending between upper and lower ends of said load member and having mounting means located intermediate of said upper and lower ends, said mounting means being coupled to and stood off from said track means by standoff means, said mounting means being adapted to couple to structure located adjacent to said load member;

(b) a lift cradle comprising guide means and arm means, said guide means for guiding said lift cradle along said track means, said guide means having bearing means for slidingly engaging said track means so as to slide thereon, said bearing means having gap means for receiving said standoff means so that said bearing means can slide between said upper and lower ends of said load member;

(c) said arm means being coupled to said guide means, said arm means protruding outwardly and being adapted to engage a load;

(d) said bearing means allowing said lift cradle to turn about said track means when said bearing means gap is free of said standoff means;

(e) lifting means for raising and lowering said lift cradle along said track means, said lifting means being coupled to the upper end of said load member.

4,983,068

CONSTRUCTION MATERIAL

William G. Kozak, 1085 Oakleigh Rd., N.W., Grand Rapids, Mich. 49504, and Felicia E. Frizzell, 1048 Griswold, SE., Grand Rapids, Mich. 49507

Filed Apr. 14, 1989, Ser. No. 337,928

Int. Cl.[5] E02B *11/00*

U.S. Cl. 405—36 4 Claims

1. A device for use in draining and retaining soil comprising:

a water permeable container, said container being made of a construction fabric material of adequate thickness to not be easily punctured by crushed scrap glass; and

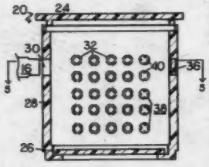
a crushed scrap glass filling material for said container.

4,983,069

DRYWELL, DRYWELL SYSTEM AND METHOD FOR CONTROLLING THE FLOW AND DIRECTION OF SURFACE WATER

Thomas Florence, 817 Shoot Flying Hill Rd., Centerville, Mass. 02632

Filed Aug. 16, 1989, Ser. No. 394,635
Int. Cl.[5] B01D *21/10*
U.S. Cl. 405—43 24 Claims



1. A drywell drainage system for the subterranean distribution of surface water to a drain field which system comprises:

(a) a water source of surface water to be subterraneally flow distributed away from the water source;

(b) a drywell positioned beneath the ground and having a cylindrical wall;

(i) at least one large diameter inlet port in the cylindrical wall of the drywell to receive the surface water;

(ii) a plurality of drain ports having a smaller diameter than the inlet port and distributed about the periphery and length of the cylindrical wall surface of the drywell;

(iii) a removable bottom cover;

(iv) a removable top cover; and

(v) the drain ports having a mechanically weaker peripheral inner section, the inner section adapted to be easily removed prior to use whereby the direction and amount of the flow of surface water discharged from the drain ports of the drywell may be controlled by the selection of the inner section of the drain ports removed; and

(c) means to direct the flow of surface water from the water source into the drywell.

4,983,070

PREFABRICATED CULVERT SYSTEM

Hyun-Ho Hwang, 2444 Benny Crescent, Apt. 609, Montreal, Quebec, Canada H4B 2R3

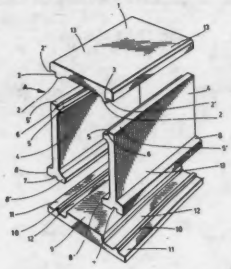
Filed Jun. 26, 1989, Ser. No. 371,528
Claims priority, application Rep. of Korea, Nov. 21, 1988, 1988-18859
Int. Cl.[5] E01F *5/00*
U.S. Cl. 405—124 3 Claims

1. A prefabricated culvert unit comprising a horizontal bottom plate including a bottom, upper, and side surfaces, parallel spaced rabbets formed in said upper surface along the length of said bottom plate laterally of each side surface, said parallel spaced rabbets forming a central tongue portion therebetween along the length of said bottom plate, a pair of side wall plates that extend vertically upwardly from said bottom plate above said parallel rabbets and said central tongue portion, each of said side wall plates having upper and lower ends;

footings formed integral with said sidewall plates along the length of the lower ends thereof; each footing having inward and outward laterally projecting footing sections that fit snugly into each of said rabbets on said horizontal bottom plate;

tongue and groove joint means formed in said footing centrally of said inward and outward laterally projecting footing sections so that said tongue fits into said groove joint means, said outward laterally projecting footing section having an outer face forming a vertical plane with said side surfaces of said horizontal bottom plate, said tongue and groove joint means on said upper surface of said horizontal bottom plate and said footings of said pair of wall plates interfitting for holding said sidewall plates against lateral displacement relative to said upper surface of said horizontal bottom plate;

a pair of ledges, each ledge being formed at and integral with the upper end of each of said sidewall plates, each ledge being located below the top edge of said sidewall and projecting inwardly of said sidewall, said ledges and sidewall plate upper ends defining shoulder-receiving nooks;



a cover plate which overlies said top edges of said sidewall plates for closing said culvert unit, said cover plate having a lower surface facing inward of said unit and including side edges;

a pair of shoulders formed integral with said cover plate, each of said pair of shoulders projecting down from said cover plate lower surface and located inwardly of the side edges of said cover plate, outwardly extending shoulders which extend from each of said downwardly extending shoulders being on a higher plane and extending outwardly to said side edges;

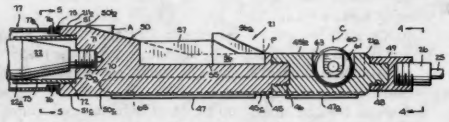
wherein said ledges and said shoulders are positioned and configured for said shoulders to fit snugly into said shoulder-receiving nooks.

4,983,071

PIPE BURSTING AND REPLACEMENT APPARATUS AND METHOD

Allan T. Fisk, Needham; David I. Freed, Weston, and Thomas A. Mann, Littleton, all of Mass., assignors to Consolidated Edison Company of New York, Inc., New York, N.Y.

Filed May 15, 1990, Ser. No. 524,231
Int. Cl.[5] F16L *1/00, 55/18*
U.S. Cl. 405—154 17 Claims



1. A pipe bursting tool for longitudinally slitting and laterally expanding a length of steel pipe, said tool having a forward end and a rearward end, comprising a substantially cylindrical portion including said forward end and whose diameter is smaller than the inner diameter of said pipe so as to be received therein, a truncated substantially conical spreader portion for laterally expanding said pipe and having a truncated apex end conjoining with said cylindrical portion and a base end adjacent to said rearward end of said tool which is substantially larger than said inner diameter of said pipe, said spreader portion having a conical surface-generating side element

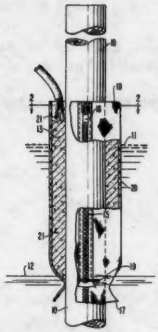
aligned with and forming a rearward extension of a cylindrical surface-generating side element of said cylindrical portion and together providing a straight side surface of said tool, said conical spreader portion thereby being eccentrically disposed with respect to the longitudinal axis of said cylindrical portion, and a fixed blade member mounted on and projecting outwardly from a second surface of said tool which is opposite to its said straight side surface, said blade member having an angularly rearward extending and forwardly facing cutting edge.

4,983,072

METHOD OF PROTECTING SUBMERGED PILING

Henry A. Bell, Jr., 5484 Pensacola Ave., Orange Beach, Ala. 36561

Filed Jul. 26, 1989, Ser. No. 385,104
Int. Cl.[5] E02D *5/60*
U.S. Cl. 405—216 **3 Claims**



1. A method for protecting a wooden structure exposed to a marine environment against attack and destruction by marine boring pests comprising:

(a) attaching a porous flexible sheet of ultraviolet-resistant material to a surface of said wooden structure exposed to said marine environment to surround said surface from said marine environment and provide a space between said sheet and said surface, said sheet surrounding said surface from ground level to above high tide line,

(b) substantially filling said space with a water-insoluble filler material selected from sand and silt, the filler material being held in place by said porous flexible sheet of ultraviolet-resistant material and resists being washed out from said space, and

(c) keeping said porous flexible sheet of ultraviolet-resistant material attached to said surface of said wooden structure so that said filler material is retained in said space to prevent marine boring pests from infesting said wooden structure and suffocate any pests in said wooden structure.

4,983,073

COLUMN STABILIZED PLATFORM WITH IMPROVED HEAVE MOTION

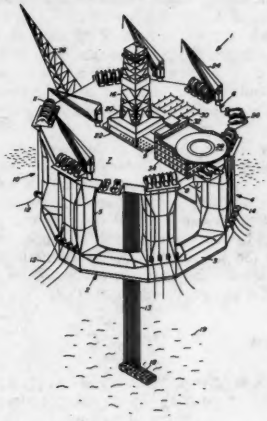
Terry D. Petty, Kenner; Luc G. Chabot, La Place; Carmon R. Costello, Kenner, and Kun K. Song, New Orleans, all of La., assignors to Odeco, Inc., New Orleans, La.

Filed Feb. 19, 1987, Ser. No. 16,317
Int. Cl.[5] E02B *17/00*; B63B *35/44*
U.S. Cl. 405—224 **29 Claims**

1. A column-stabilized, semi-submersible platform for conducting in a seaway drilling or production operations, or both, in and/or from a well site in the seabed submerged in a deep body of water, comprising:

(a) a submersible lower hull including a plurality of hollow, tubular, spaced-apart hull segments;

(b) a superstructure extending from said lower hull, said superstructure including a plurality of substantially vertical, hollow, tubular stabilizing columns and an upper hull supported by said columns;



(c) at least one wellhead tree suspended from a deck on said platform for controlling said production;

(d) a production riser coupling said wellhead tree to at least one well on said site; and

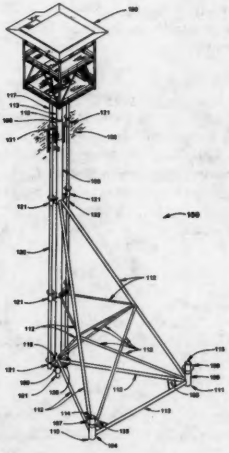
(e) a plurality of catenary mooring lines for mooring said platform to said seabed during said drilling or production or both.

4,983,074

OFFSHORE SUPPORT STRUCTURE METHOD AND APPARATUS

Samuel C. Carruba, Houston, Tex., assignor to CBS Engineering, Inc., Houston, Tex.

Filed May 12, 1989, Ser. No. 351,439
Int. Cl.[5] E02B *17/00*; E02D *31/00*
U.S. Cl. 405—227 **8 Claims**



1. An offshore support structure for use with at least one well located in a body of water, comprising:

only three tubular legs, each leg having upper and lower

ends, a first leg having a length longer than the depth of the body of water, and the upper end of the first leg is adapted to be disposed above the surface of the body of water, the second and third legs each having substantially the same length, which length is shorter than the depth of the body of water;

a single pile disposed in each of the legs and adapted to be driven into the ground below the body of water, the pile disposed in the first leg being a hollow pile having an upper and a lower end and extending outwardly and upwardly from the first leg and being fixedly secured thereto;

a plurality of bracing members disposed between and interconnecting the three tubular legs; and

the at least one well is disposed within the hollow pile disposed in the first leg, whereby the only portion of the support structure subject to the action of waves on the surface of the body of water is the upper end of the first leg and the hollow pile disposed in the first leg becomes part of the support structure and is capable of withstanding lateral and axial loads exerted upon the support structure.

4,983,075

PROCESS FOR PRODUCING AN ACID-RESISTANT BARRIER SEAL IN SOIL, AND CONCRETE USABLE FOR THIS PURPOSE

Francis M. Deimas, Paris, and Michel A. Gandais, Perthes, both of France, assignors to Sondages Injections Forages Entreprise Bachy, Levallois-Perret, France

Filed May 30, 1989, Ser. No. 357,954

Claims priority, application France, May 31, 1988, 88 07206

Int. Cl.[5] E02D *29/00*

U.S. Cl. 405—267 **5 Claims**

1. A process for producing a barrier seal in soil which is resistant to acidic water having a pH below 5.5, comprising the steps of excavating a trench in the soil and filling the trench with a sealing concrete consisting essentially of water, a clay, an acid-resistant granulate with self-filtering properties, and an aqueous solution of sodium and/or potassium silicate, said concrete being devoid of any acidic or acid-generating matter liable to form a silicic acid gel with the silicate, the proportion of sodium and/or potassium silicate, calculated in the form of SiO_2, incorporated in the sealing concrete being between 5 and 70 kg per cubic meter of concrete, so as to give rise to the formation of a leakproof local barrier when said barrier seal is locally subjected to the percolation of acidic water originating from the surrounding soil.

4,983,076

FACINGS FOR EARTHWORKS

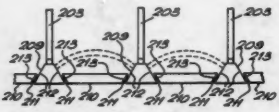
Henri Vidal, Neuilly-sur-Seine, France

Filed Nov. 14, 1988, Ser. No. 270,193

Claims priority, application United Kingdom, Nov. 13, 1987, 8726636; Feb. 1, 1988, 8802131; Apr. 29, 1988, 8810184

Int. Cl.[5] E02D *29/02*

U.S. Cl. 405—284 **13 Claims**



1. A facing for an earthwork, said facing having front and rear sides and lying in a plane, said facing comprising: a plurality of earth pressure bearing sections rigidly positioned relative to earth disposed on the rear side of the facing, said earth pressure bearing sections being arranged to form an array of interconnected polygonal frames, and other sections that are connected to said earth pressure bearing sections so as to be enclosed by the polygonal frames in the plane of the facing, said other sections including means for permitting limited resilient movement of rearwardly adjacent earth in a direction substantially perpendicular to the plane of the facing whereby earth pressure on said other sections is reduced by establishment of arching forces between said pressure bearing sections.

4,983,077

METHOD AND AN APPARATUS FOR PRODUCING FABRIC-REINFORCED LINING SUPPORTS OR SLENDER SUPPORTING STRUCTURAL UNITS

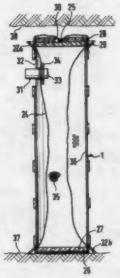
Werner Sorge, Herne, and Klaus Konieczny, Recklinghausen, both of Fed. Rep. of Germany, assignors to Gebhardt & Koenig-Gesteins- und Tiefbau GmbH, Recklinghausen, Fed. Rep. of Germany

Filed Jan. 7, 1988, Ser. No. 142,717

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728370

Int. Cl.[5] E21D *15/00*

U.S. Cl. 405—288 **22 Claims**



1. A method for producing a fabric-reinforced support, in particular in mines and tunnel construction, consisting of a hardening building material and a reinforcement comprising the steps of:

stretching a fabric tube which is closed at both ends generally vertically between a floor and roof of an underground chamber;

surrounding a portion of the fabric tube between its ends with a generally cylindrical and perforated rigid shell casing which leaves at least one end portion of the fabric tube unsurrounded;

filling the fabric tube with pressurized liquid building material until the ends of the filled tube abut the floor and the roof and until the unsurrounded end portion of the fabric tube bulges radially outwardly beyond the circumference of the cylindrical shell casing adjacent its respective floor or roof;

filtering the liquid building material through the fabric tube which removes the water of the liquid building material to the outside of the fabric tube and retains the drained solids of the liquid building material on the inside of the fabric tube in the form of a pillar that quickly hardens from bottom to top, with the fabric tube serving as a self-supporting outer reinforcement for the hardened pillar;

draining the water removed from the fabric tube through the perforations in the shell casing; and

removing the shell casing from about the fabric tube before the building material completely hardens.

4,983,078

ROTARY CUTTING TOOL

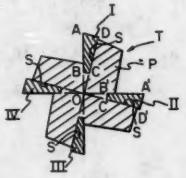
Atsuo Unozawa, 2-30-17 Amanuma, Suginami-ku, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,553

Claims priority, application Japan, Jul. 13, 1987, 62-174503

Int. Cl.[5] B26D *1/12*

U.S. Cl. 407—34 **5 Claims**



1. A rotary cutting tool assembly comprising:
a tool body having a central axis;
a circumaxial series of equiangularly spaced cutting elements mounted in fixed position on said tool body;
each of said cutting elements having a rake face and a back thrust face opposite said rake face, said rake face and said back thrust face of each of said cutting elements being disposed in a corresponding rake plane and a corresponding back thrust plane wherein a line formed by the intersection of said rake plane and said back thrust plane is colinear with said central axis, enabling the rigidity of the cutting tool assembly to be improved.

4,983,079

TWIST DRILL

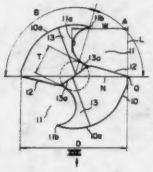
Koujiro Imanaga; Shinichi Nakamura; Hideji Hosono, and Yoshiyuki Yanase, all of Gifu, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,916

Claims priority, application Japan, Dec. 14, 1987, 62-315501; Dec. 14, 1987, 62-315502; Dec. 17, 1987, 62-319509; Dec. 22, 1987, 62-324589; Jul. 19, 1988, 63-180005; Jul. 20, 1988, 63-180494; Jul. 22, 1988, 63-183275; Jul. 22, 1988, 63-183277; Jul. 25, 1988, 63-184818; Jul. 28, 1988, 63-188650; Jul. 28, 1988, 63-188651

Int. Cl.[5] B23B *51/02*

U.S. Cl. 408—230 **27 Claims**



1. A twist drill comprising:
a cylindrical body including:
an axis of rotation longitudinally therethrough;
a forward end which contacts a workpiece;
a web thickness of 0.2 D to 0.35 D, D being a diameter of said body; and
a spiral flute formed in an outer peripheral surface of said body so as to extend spirally along a longitudinal length thereof to said forward end and a land disposed adjacent to said flute, and having a flute-width ratio of 0.5 to 0.9, said flute having:
a first wall facing in a direction of rotation of said body and a second wall extending from an inner end of said first wall to the outer periphery of said body, said first wall terminating at said forward end in a first cutting lip having a radially outermost end disposed on the outer periphery of said body, said second wall being concavely shaped when viewed from said forward end and formed so that, assuming a first line extending from said outermost end perpendicular to a second line connecting said outermost end and said axis of said body, the maximum distance between said first line and said second wall is set in a range from 0.45 D to 0.65 D.

4,983,080

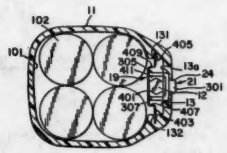
PUSH-BUTTON CONTROLLED APPARATUS FOR RELEASABLY STORING A TOOL BIT

Robert I. Somers, Reisterstown, Md.; William G. Harman, Jr., Glenrock; Frank O'Hara, Hanover, both of Pa., and William R. Stumpf, Kingsville, Md., assignors to Black & Decker, Inc., Newark, Del.

Continuation-in-part of Ser. No. 81,867, Aug. 5, 1987, abandoned. This application Sep. 19, 1989, Ser. No. 409,489

Int. Cl.[5] B23B *45/00*

U.S. Cl. 408—241 R **21 Claims**



19. A tool comprising:
a housing;
a tool bit stored in an inoperative location in the housing;
a cavity in the housing opening at a peripheral surface thereof and shaped for sliding receipt of all of the tool bit;
retention means in the cavity for resiliently urging the tool bit into frictional engagement with a wall of the cavity and retaining the bit in the cavity;
a holding means in the cavity engaging the bit and movable between a first position wherein all of the bit is enclosed within the cavity and second position wherein the bit is partially exposed from the cavity; and
actuating means slidably movable in the housing transversely of the cavity for deflecting the retention means away from the tool bit when pressure is exerted on the actuating means thereby enabling the holding means to move from said first position to the second position.

4,983,081

APPARATUS AND METHOD FOR FORMING SHIPLAP DUCT

Robert A. Cunningham, Jr., Argyle, Tex., assignor to Glass Master Corporation, San Antonio, Tex.

Filed Jun. 1, 1989, Ser. No. 360,196

Int. Cl.[5] B23D *3/06*

U.S. Cl. 83—39 **11 Claims**

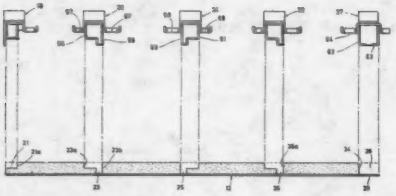
11. The method of grooving a duct board having opposed left and right side edges and opposed top and bottom edges comprising:
sliding a number 1 cutting tool along one side edge of a duct board and cutting a female shiplap notch,
selecting an angle square having a guide leg with a guide surface extending along the length thereof and a base leg having numerical indicia beginning at a value x from the guide surface and positioning the square with the base extending along the bottom edge of the duct board with a first selected indicia at the vertical surface of said female shiplap notch and said guide leg overlying said duct board,

selecting a second cutting tool for cutting a shiplap groove with the step side of the groove adjacent said female notch and a sled on the step side of the groove with a width of a value y and moving said second tool along the guide surface to cut a first shiplap groove,

positioning the base leg with a second selected indicia at the non-step side of said first shiplap groove,

selecting a third cutting tool for cutting shiplap groove of opposite hand to said first shiplap groove and having a sled on the non-step side of the groove with a width of a value y plus the thickness of said board and moving said third tool along the guide surface to cut a second shiplap groove,

positioning the base leg with said first indicia at the step side of said second shiplap groove,



moving said second cutting tool along the guide surface to cut a third ship lap groove,

positioning the base leg with said second selected indicia at the non-step side of the third shiplap groove,

selecting a number 5 cutting tool with a sled on the side adjacent said third shiplap groove having a width of a value y plus the thickness of said board and moving said number 5 tool along said guide surface to cut a U-shaped groove, and

cutting through the barrier material of the duct board on the side the U-shaped groove opposite said third shiplap groove,

the sum of x and y equal to the value of said beginning indicia.

4,983,082

EXPANSION ANCHOR ASSEMBLY

Fritz Mark, Máder, Austria, assignor to Hilti Aktiengesellschaft, Fürstentum, Fed. Rep. of Germany

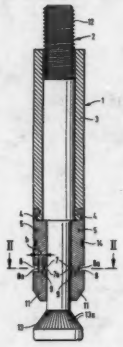
Filed Oct. 16, 1989, Ser. No. 421,928

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835243

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—60 **7 Claims**

1. Expansion anchor assembly arranged to be secured in a borehole formed in a receiving material, comprising an axially elongated expansion sleeve having a first end and a second end spaced apart in the axial direction, and an axially elongated anchor rod arranged to extend through said sleeve, said anchor rod having a first end and a second end, said expansion sleeve having a plurality of expansion sections extending axially from the first end toward the second end of said expansion sleeve, said expansion sections are spaced apart in the circumferential direction by axially extending slots, said anchor rod has an expansion cone on the first end thereof for displacing said expansion sections radially outwardly when said cone is drawn into the first end of said sleeve toward the second end thereof, each of said expansion sections has a circumferentially extending weakened section spaced axially from the first end of the expansion sleeve, said weakened sections are located between a first recess formed in a radially inner surface of said expansion sections and a second recess formed in a radially outer surface of said expansion sections, said weakened sections acting as a bending location for said expansion sections, wherein the improvement comprises that each of said first and second recesses has a base extending rectilinearly and tangentially relative to the axis of said expansion sleeve, said first and second recess bases are located in a common plane disposed



normal to the axis of said expansion sleeve, and said weakened sections in combination form a hollow rectangular cross section transversely of the expansion sleeve axis.

4,983,083

ANCHOR ROD

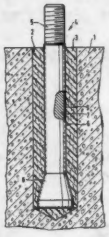
Peter Froehlich, Neuried; Ludwig Gebauer, Olching; Manfred Hartmann, Kaufering; Helmut Mirsberger, Munich, and Monika Moench, Landsberg/Lech, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft

Filed Jul. 10, 1989, Ser. No. 377,489

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823163

Int. Cl.[5] F16B *39/02*

U.S. Cl. 411—82 **24 Claims**



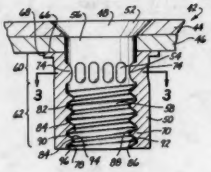
1. An anchor unit to be anchored in an opening in a structural component comprising a hardenable mortar compound, and an axially extending anchor rod having a leading end to be inserted first into the opening and a trailing end, said anchor rod having an axially extending expansion section with at least an axially extending part widening in the direction toward the leading end, wherein the improvement comprises means for preventing adhesion between said anchor rod and the hardened mortar compound, said anchor rod has an axially extending anchoring region, said anchoring region defining said axially extending expansion section widening toward the leading end of said anchor rod, said expansion section being conically shaped, said conically shaped expansion section having a plurality of spaced ribs extending in the axial direction and projecting outwardly from said conically shaped expansion section.

4,983,084

DOUBLE LOCKED THREADED FASTENER

Warren E. Gray, Woodland Hills, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Sep. 26, 1989, Ser. No. 412,688
Int. Cl.[5] F16B *39/30*
U.S. Cl. 411—311 13 Claims



1. A fastening assembly comprising:

an elongated fastening element and a nut;

said elongated fastening element having a retaining means at one end for maintaining said fastening element against axial movement in a first direction in a hole in a workpiece to be fastened;

said elongated fastening element further including external threads adjacent its other end, and a shank area intermediate said retaining means and said threads;

said elongated fastening element including anti-rotation means for providing a gripping surface opposing rotation about said elongated fastening element, said anti-rotation means independent of said threads and located on a portion of said shank area adjacent said threads;

said nut having a workpiece engagement end and a hollow bore extending through said workpiece engagement end into said nut;

a first portion of said hollow bore proximal to said work piece engagement end of said nut being free of threads, a second portion of said hollow bore distal from said workpiece engagement end having internal threads, said internal threads on said second portion of said hollow bore of said nut capable of threading onto said external threads on said elongated fastening element to clamp a workpiece under a clamping load between said elongated fastening element retaining means and said workpiece engagement end of said nut;

the threads of at least one of said internal and said external threads being asymmetric threads, said asymmetric threads having a thread root of a shape which is noncomplementary to the shape of the thread crest of its opposing mating thread whereby the crest of the opposing mating thread frictionally locks against the noncomplementary root when said workpiece engagement end of said nut is brought against a workpiece at said clamping load;

said asymmetric threads including an essentially planar inclined root surface, said inclined surface intersecting the side of the thread leading the root at a first angle of about 150° degrees and intersecting the side of the thread trailing the root at a second angle of about 90° degrees, the crest of the opposing mating thread fictionally locking against said inclined surface when said workpiece engagement end of said nut is brought against a working piece at said clamping load;

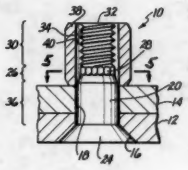
said first portion of said hollow bore of said nut capable of being swaged into intimate contact with said anti-rotation means on said elongated fastening element to fix said first portion of said nut to said elongated fastening element against rotation of said nut on said elongated fastening element.

4,983,085

THREADED LOCKABLE FASTENER WITH SWAGED COLLAR

Warren E. Gray, Woodland Hills, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Sep. 26, 1989, Ser. No. 412,371
Int. Cl.[5] F16B *19/00*
U.S. Cl. 411—361 15 Claims



1. A fastener system comprising:

an elongated fastening element having ends, a malleable fastener and a swaging tool,

said elongated fastening element having retaining means for limiting movement at one of its ends,

said elongated fastening element further having one of helical threads or circumferentially extending grooves adjacent its other end, said one of said helical threads or circumferentially extending grooves for providing a gripping surface opposing axial movement along said elongated fastening element,

said elongated fastening element including a plurality of axially extending grooves and ridges of comparable size located on said elongated fastening element between said retaining means and said one of said helical threads or circumferentially extending grooves, said axially extending grooves for providing a gripping surface opposing rotation about said elongated fastening element,

said malleable fastener being swaged with said swaging tool from an initial state to a swaged state in which it is deformed into intimate contact with axial grooves and one of said threads or in circumferential grooves,

in said initial state said fastener shaped essentially as a hollow collar having an outside surface and an interior surface, said collar sized and shaped to freely slide on said elongated fastening element over both said axially extending grooves and said one of said helical threads or circumferentially extending grooves,

in said swaged state said interior surface of said fastener intimately contacting and irreversibly locking against both axial and rotational movement with respect to said elongated fastening element by assuming a complementary shape to said elongated fastening element about both said axially extending grooves and said one of said helical threads or circumferentially extending grooves and by frictional engagement therewith, and

said swaging tool having a hollow interior, said swaging tool hollow interior including means for contacting said outside surface of said fastener and inwardly crimping said fastener to distort said interior surface of said fastener to intimately contact and complementarily conform to said elongated fastening element about both said axially extending grooves and said one of said helical threads or circumferentially extending grooves.

4,983,086

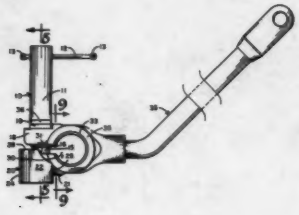
FASTENER FOR BATTERY CONNECTOR

David L. Hatrock, 1203 E. Linden, Coeur d'Alene, Id. 83814

Continuation-in-part of Ser. No. 6,383, Jan. 20, 1987, abandoned. This application Nov. 25, 1988, Ser. No. 276,310

Int. Cl.[5] F16B *37/00*

U.S. Cl. 411—366 1 Claim



1. A fastener for a "U" shaped bifurcated battery connector, having paired opposed fastening fingers each defining aligned bore holes to accept an elongate fastener therebetween, to connect that battery connector upon a battery terminal, comprising in combination;

an elongate bolt fastening member formed of semi-rigid, resilient non-metallic material that deforms to allow battery connector fingers carrying the bolt fastening member in the bores defined therein to move toward and away from each other without deforming the bores in said fingers, said bolt fastening member having

an enlarged head portion, with means to aid rotation thereof, structurally communicating with an axially aligned diametrically smaller medial medial shank portion of predetermined length, configured to fit through a bore defined in a first finger of the bifurcated battery connector, with a locking device releasably securable on the shank at a spaced distance from the head to prevent axial movement of the fastening member relative to the said first finger when the reduced portion is positioned within the bore of the first finger, and a forward threaded portion at the end opposite the head; and

a nut member, formed of semi-rigid resilient non-metallic material, defining a cavity bounded by a flange on one end and by a floor on the other end, said floor defining a threaded bore and said cavity configured to accept the end part of a second finger of a bifurcated battery terminal connector in mating relationship with said threaded bore aligned with a bore defined in the second finger to accept the threaded end portion of the bolt member is threaded engagement therethrough, the nut member formed with relief cuts in at least one corner and in the floor thereof to allow the nut member to fit upon the end part of a fastening finger of a battery connector defining a boss.

4,983,087

SCREW TYPE BALE HANDLING DEVICE

James V. Mierek, Ava, N.Y. 13303

Filed Nov. 5, 1985, Ser. No. 795,208

Int. Cl.[5] A01D *87/00*

U.S. Cl. 414—24.5 3 Claims

1. Tractor mountable handling apparatus for handling bales of material comprising

a frame mountable onto a tractor vehicle;

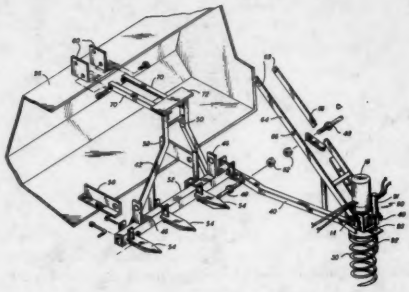
a bearing member mounted on said frame;

a shaft journalled in said bearing member;

rotary drive means mounted on said bearing member and including coupling means connecting to said shaft for selectively rotating the same in either direction and for holding the same against rotation; and

a helical screw mounted coaxially on said shaft having an open end for engaging the baled material and having a pitch selected small enough so that the bale will not unwind from the helical screw under its own weight while being handled by said apparatus;

wherein said frame is a two position frame formed of a rear frame member held fixed on a support on said tractor vehicle, a swinging frame member having a pivot member



journalled at a lower side of said rear frame member and an upper mount on which said bearing member is mounted, and a brace member coupled to said upper mount and selectively connected at either of two positions along its length to said rear frame member such that said screw is held in either of a horizontal handling position when said swinging frame member is swung up to said rear frame member or a vertical handling position when said swinging frame member is swung out from said rear frame member.

4,983,088

APPARATUS FOR STACKING FLAT WORKPIECES ON STACKING PINS OR AN ENDLESS CONVEYING ELEMENT

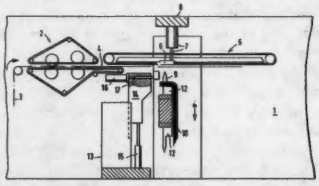
Friedhelm Mundus, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 20, 1989, Ser. No. 452,461

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1989, 3900898; Mar. 23, 1989, 3909700

Int. Cl.[5] B65G *57/03*

U.S. Cl. 414—27 6 Claims



1. An apparatus for stacking flat workpieces provided with stacking holes, said apparatus comprising,

stacking pins mounted on an endless flexible conveying element revolving around reversing pulleys, said conveying element being advanced by one step whenever a stack consisting of a predetermined number of workpieces has been formed,

a feeder for feeding consecutive workpieces to be stacked, means for pushing the workpieces onto said stacking pins,

said stacking pins being mounted on elongate pedestals, said elongate pedestals being secured to the conveying element and having a width smaller and a length larger than a diameter of the stacking holes,

at least one substantially U-shaped carrying member forming a temporary stacking finger being secured to a carrier and being adapted to be moved inwardly and having a cross-section smaller than the diameter of the stacking holes, and

said carrying member being movable to at least one position where said carrying member extends around part of a stacking pin and having at most the same height as each pedestal and being vertically displaceable relative to ..the pedestal and to the upright stacking pin on the pedestal.

4,983,089

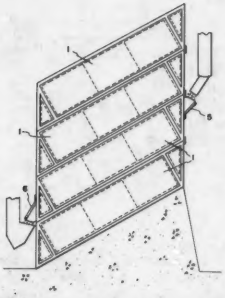
MOBILE SILO

Ernst D. Rose, Rue Pascal 1245-A, Campo Bello, 04616 Sao Paulo City, Brazil

Filed Dec. 26, 1989, Ser. No. 456,893

Int. Cl.[5] B65G *1/00, 65/00*

U.S. Cl. 414—276 **15 Claims**



1. A mobile grain silo for the transportation and storage of grain, granulated or pelletized food and other related materials, comprising:

(a) a plurality of individual storage cells for storing and transporting a segregated load of grain,

(b) a supporting frame structure formed from a plurality of stanchions and defining the outer dimensions of said individual storage cells,

(c) a plurality of retaining walls fixedly secured to said frame structure and defining a storage compartment therein for retaining said grain within said individual storage cells,

(d) locking means for lifting and interlocking said individual storage cells in stacked relation to one another,

(e) said plurality of retaining walls including a top wall, a bottom wall, a first end wall, a second end wall, and two side walls,

(f) viewing means on said top wall for inspecting said storage compartment of said storage cells,

(g) loading means on said first end wall for loading said grain into said storage cells, and

(h) exit means on said second end wall for discharging said grain from said storage cells.

4,983,090

SYSTEM FOR FEEDING BULK MATERIAL

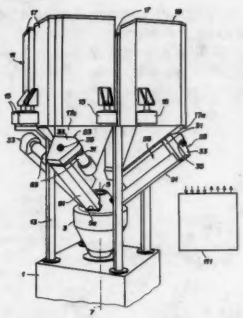
Rolf Lehmann, Seon, and Daniel P. Kaelin, Aarau, both of Switzerland, assignors to K-Tron International, Inc., Pitman, N.J.

Filed May 9, 1989, Ser. No. 349,086

Claims priority, application Switzerland, Jan. 25, 1989, 217/89

Int. Cl.[5] B65G *1/00*

U.S. Cl. 414—326 **24 Claims**



1. System for feeding at least one bulk material, the system comprising at least one storage device for storing bulk material, wherein a conveyor channel, a conveyor member and a chute each are provided for and associated with each said storage device, said conveyor channel is disposed below and is connected with an associated storage device and is provided with an entrance communicating with the inner.space of said associated storage device and an exit, said conveyor channel is disposed sloping upward from said entrance to said exit, said conveyor member is mounted in said conveyor channel and adapted to convey along said conveyor channel bulk material entering said conveyor channel from said associated storage device, each said chute is adapted to be removably connected in at least two distinct positions with an associated said conveyor channel to carry bulk material coming therefrom in a downward direction, each chute extending, in a first of said distinct positions along a bottom boundary of said associated conveyor channel and having said exit open into the respective chute, so that any bulk material arriving from said exit into said chute slides through said chute downward in a direction parallel but opposite to the direction along which the bulk material is conveyed inside said associated conveyor channel from the entrance thereof to said exit, said chute being arranged to form an angle with said associated conveyor channel in at least one further of said at least two distinct positions.

4,983,091

ORGANIZER SYSTEM AND METHOD FOR A ROTATABLE STORAGE STRUCTURE

Robert Lichti, Sr., Lake Almanor Peninsula; Clay Bernard, II, Pt. Richmond; Daniel C. Perry, San Jose, and Stanley H. Lukken, San Francisco, all of Calif., assignors to Computer Aided Systems, Inc., Hayward, Calif.

Continuation-in-part of Ser. No. 31,989, Mar. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 732,927, May 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 824,718, Jan. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 821,257, Jan. 20, 1986, Pat. No. 4,752,175. This application Apr. 29, 1988, Ser. No. 192,419

Int. Cl.[5] B65G *1/06*

U.S. Cl. 414—331 **14 Claims**

1. A storage system for storage and retrieval of containers

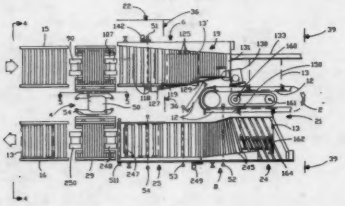
adapted to carry material goods, the storage system comprising:

a rotary storage carousel for receiving and storing the containers, the carousel including a multiplixity of container support racks arranged in a plurality of vertically spaced apart tiers, each tier having a multiplicity of container support racks arranged in side by side fashion, means forming a continuous track, and means for rotating the container support racks about the continuous track;

conveyor means for carrying containers to and from said carousel;

a vertically oriented lift assembly for transporting said containers between the conveyor means and the various carousel tiers, said lift assembly including a plurality of platforms that are spaced apart in intervals substantially equivalent to the spacing between the storage carousel tiers;

insertion means for inserting containers onto said container



racks, the insertion means including a plurality of inserter assemblies for placing containers on said container racks, each said inserter assembly being associated with a particular one of said storage carousel tiers and including an inserter holding section for temporarily retaining at least one container in a position free from interference with movements of the storage carousel and the lift assembly, and a conveyor approach section for directing containers onto the rack at a loading position; and

extraction means for extracting containers from said container racks, the extraction means including a plurality of extractor assemblies for taking containers off of the container racks, each said extractor assembly being associated with a particular one of said storage carousel tiers and including an extractor holding section for temporarily retaining at least one container in a position free from interference with movements of the storage carousel and the lift assembly, and a removal section for extracting the containers from the storage carousel.

4,983,092

RETRACTABLE ARM/LOADER ASSEMBLY

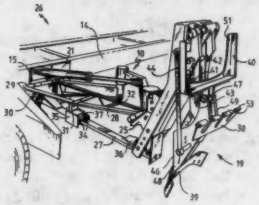
Idwall C. Richards, Banora Point, Australia, assignor to Jayrich Engineering PTY Ltd., Chinderah, Australia

Filed Aug. 24, 1989, Ser. No. 398,139

Int. Cl.[5] B65F *3/14*

U.S. Cl. 414—408 **10 Claims**

1. A refuse vehicle including a retractable arm assembly comprising first and second arms having respective ends pivotally coupled together a loading mechanism coupled to the other end of the second arm and a guide means which, in use, extends outwardly of said vehicle, said first arm being pivotally coupled to a side of said vehicle whereby said first and second arms are each constrained to move in substantially horizontally planes when the vehicle is on a horizontal surface, drive means being coupled to said second arm or to the loading mechanism for controllably extending and retracting said other



end of said second arm outwardly of said vehicle with and in the direction of travel of said guide means.

4,983,093

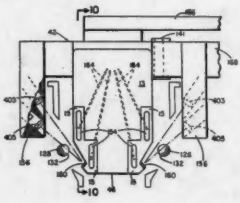
WAFER TRANSFER APPARATUS

Richard F. Foulke, Carlisle, and Steven M. Lord, Malden, both of Mass., assignors to Proconics International, Inc., Wilmington, Mass.

Continuation of Ser. No. 338,405, Apr. 12, 1989, abandoned, which is a continuation of Ser. No. 52,571, May 20, 1987, abandoned, which is a division of Ser. No. 667,550, Nov. 2, 1984, Pat. No. 4,682,928, which is a division of Ser. No. 381,292, May 24, 1982, Pat. No. 4,493,606. This application Jan. 29, 1990, Ser. No. 471,703

Int. Cl.[5] B65G *65/02*

U.S. Cl. 414—416 **7 Claims**



1. Apparatus for transferring semiconductor wafers, comprising

a wafer-pickup element with at least two openings each located closer to the edge of a wafer than to the wafer's center, and

means for providing a below-atmospheric pressure or vacuum at said openings for the purpose of adhering a wafer to said wafer-pickup surface,

whereby wafers may be picked up with greater certainty as to the locations of their edges with respect to said pickup element,

said openings being surrounded by raised portions such that the region of said wafer-pickup element between said openings is at a lower elevation than said raised portions, whereby warped wafers may be picked up.

4,983,094

LOAD LIFTING ATTACHMENT

David T. Ping, Mentor, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Jul. 18, 1986, Ser. No. 886,993

Int. Cl.[5] B66C *1/66*

U.S. Cl. 414—621 **18 Claims**

1. A load lifting attachment, comprising:

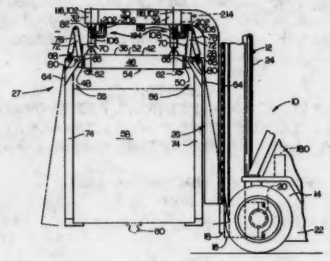
a carriage having a connecting frame and being adapted to move between elevationally spaced apart locations;

a load engaging frame having first and second spaced apart end portions;

a plurality of load engaging members mounted on the load engaging frame;

a first link assembly having first and second spaced apart end portions and being pivotally connected at said first link assembly first end portion to the connecting frame and at said first link assembly second end portion to the load engaging frame first end portion, said first link assembly first and second end portions being freely elevationally movable relative to each other;

a second link assembly having first and second spaced apart end portions and being pivotally connected at said second link assembly first end portion to the connecting frame and at said second link assembly second end portion to the



first end portion of the load engaging frame, said second link assembly first and second end portions being freely elevationally movable relative to each other;

means for connecting the load engaging frame second end portion to the connecting frame and maintaining said load engaging frame second end portion for free and controllably powered elevational movement relative to the connecting frame, said connecting means having a longitudinal axis extending between the load engaging and connecting frames, said connecting means being extensibly movable in directions along said longitudinal axis and said load engaging frame second end portion being elevationally movable in directions along said longitudinal axis in response to extensible movement of said connecting means along said longitudinal axis.

4,983,095

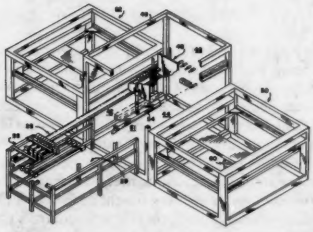
WORKLOAD REGULATOR FOR AUTOMATED PRODUCTION

Wayne T. Chiappe, Hinsdale, Ill., and Randy W. Gasquoine, Stockton, Calif., assignors to Sardee Corporation, Alsip, Ill.

Division of Ser. No. 906,063, Sep. 11, 1986, Pat. No. 4,808,057.
This application Dec. 20, 1988, Ser. No. 287,479
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—786 **4 Claims**

1. A method for automatically regulating a flow of articles between a first work station, whereat a string of articles is produced at a first variable cyclic operating rate, and a second downstream work station, whereat an operation is performed on said string of produced articles at a second variable, cyclic operating rate, such that at least one of said work stations may continue in uninterrupted operation and at a desired operating rate when the rate of operation of the other work station is temporarily varied or interrupted, said method comprising:

providing an inbound staging area whereat a plurality of pre-formed groups of said produced articles are temporarily accumulated prior to transfer, said inbound staging area including a plurality of inbound lanes, each inbound lane being adapted to receive a succession of said groups, providing an outbound staging area whereat a plurality of groups of produced articles are temporarily accumulated prior to advancement to said second work station, said outbound staging area including a plurality of outbound lanes, each outbound lane being adapted to receive a succession of said groups, providing a transfer station adjacent said inbound staging area and said outbound staging area, said transfer station including a storage area and a storage container in said storage area, providing a transfer head at the transfer station, said transfer head including means for gripping and releasing a group of articles, said transfer head being independently movable to and from the inbound staging area, the outbound staging area and the storage area, feeding at least one string of articles from said first work station toward said inbound staging area, successively subdividing a leading portion of each string to define a group of articles from the remainder of said string, separating each group thus formed from the remainder of said string by advancing said group to the inbound staging area as the next succeeding group is being formed, continuously determining a cumulative inbound rate equal to the rate at which successive groups are being advanced into the inbound staging area, using



the transfer head to remove groups of articles from the inbound staging area, one inbound lane at a time, at a pick-up rate substantially equal to said cummulative inbound rate, using the transfer head to transfer groups of articles, one group at a time, to an outbound lane in said outbound staging area at a placement rate, withdrawing groups of articles from said outbound staging area by moving each group along an outbound lane to said second downstream work station, said moving step including the step of consolidating successive groups to re-form a string of articles in each outbound lane, continuously determining a cummulative outbound demand rate equal to the rate at which groups of articles must be withdrawn to provide a sufficient supply of articles to maintain a desired rate of operation at said second work station, adjusting the placement rate so that it is substantially equal to said outbound demand rate, and balancing the pick-up rate with said placement rate by directing the transfer head to additionally transfer a sufficient number of groups to and from said storage container so that the desired regulated flow is achieved.

4,983,096

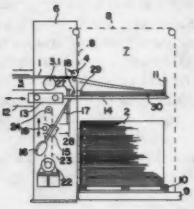
DEVICE FOR STACKING SHEETS, ESPECIALLY SHEETS OF CARDBOARD

Jakob Bodewein, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusselforf, Fed. Rep. of Germany

Filed Jul. 10, 1989, Ser. No. 377,515
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1988, 3823806
Int. Cl.[5] B65G *31/32*
U.S. Cl. 414—789.5 **3 Claims**

1. In a device for stacking sheets, such as cardboard, comprising a mechanism that continuously supplies the sheets to a

stacking area located above a stacking platform that can be lowered, an auxiliary stacking platform that can be advanced into the stacking area, and a ream-demarcating mechanism for inserting ream-demarcation strips between the rear edges of the sheets while they are being laid off, the improvement wherein the auxiliary stacking platform (13) cannot move up and down, and the outlet end (18) of the ream-demarcating mechanism (15) is located forwardly of the sheet supply mechanism and rearwardly of the stacking area and can be moved vertically between the sheet-supply mechanism (3) and the auxiliary stacking platform, the auxiliary stacking platform (13)



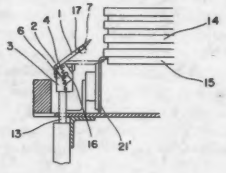
being in the form of a rod grating, the ream-demarcating mechanism (15) being provided with an orientation channel (17) that extends up between rods (14) in the auxiliary stacking platform, the ream-demarcating mechanism (15) being secured to a shaft (19) that extends transversely below rods (14) in the auxiliary stacking platform (13), means being provided for lowering the outlet end (18) of the ream-demarcating mechanism below the rods, the device further including a component (27) that continuously detects the height of the stack (30) rising on the auxiliary stacking platform (13), and controls that adjust the level of the outlet end (18) of the ream-demarcating mechanisms (15) as the level of the top of the stack rises.

4,983,097

TRAY TIER STACKING APPARATUS

Hideyuki Ema, Moriguchi; Kazuichi Yamashita, Kyoto, and Kiyoshi Matsuura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 27, 1989, Ser. No. 413,388
Claims priority, application Japan, Sep. 29, 1988, 63-244905
Int. Cl.[5] B65G 59/06
U.S. Cl. 414—795.2 3 Claims



1. A tray stacking apparatus for stacking trays having a stepped portion into a tier, said apparatus comprising:

a tier stacking apparatus portion disposed to the side of a tray stacking location, said tier stacking apparatus portion including a pawl projecting toward the tray stacking location, said pawl having a projecting piece extending therefrom, support means on which said pawl is mounted for pivotably supporting said pawl about a pivot axis, and urging means connected to said pawl for biasing said pawl in one direction of rotation about said pivot axis when the pawl is pivoted a predetermined amount in said one direction away from the tray stacking location toward an open position and for biasing said pawl in the other direction of rotation when said pawl is pivoted a predetermined amount in said other direction from the open position thereof;

a vertical driving portion comprising drive means operatively connected to said tier stacking apparatus portion for selectively raising and lowering the pawl thereof between respective bottom and upper limit positions along a vertical path;

a pawl opening roller supported in the apparatus at a fixed first location along said path at which first location the roller contacts the projecting piece of said pawl, as the pawl is lowered by said drive means, and causes the pawl to pivot the predetermined amount in said one direction; and

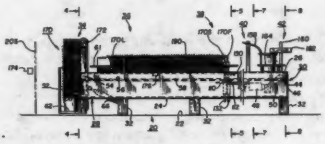
a pawl returning roller supported in the apparatus at a fixed second location along said path and adjacent said bottom limit position and at which second location the pawl returning roller contacts said pawl, as the pawl is lowered to said bottom limit position, and causes the pawl to pivot the predetermined amount in said other direction.

4,983,098

SEPARATING AND FEEDING A PREFORMED CONTAINER FROM A NESTED STACK

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed Jan. 10, 1990, Ser. No. 463,121
Int. Cl.[5] B65G 59/10
U.S. Cl. 414—798.9 18 Claims



1. An improved apparatus for separating and feeding a preformed container from a nested stack of containers, said apparatus including:

(a) an elongated base assembly adapted for resting on a floor, said base assembly including a pair of elongated side frame members held in a selected spaced relationship, each side frame member having an upper edge portion, an infeed end and a discharge end;

(b) at least two endless long belts extending from said infeed end to said discharge end of said base assembly, each of said long belts having a top strand and a bottom strand, each long belt carried on a first drive pulley and at least one driven pulley, said first drive pulley and each of said driven pulleys being selectively positioned interior of said side frame members;

(c) a shaped elongated trough member mounted interior of said base assembly, said trough member adapted to support said top strand of each of said long belts in a selectively spaced and substantially parallel alignment along said upper edge portion;

(d) a drive means connected to each of said first drive pulleys, said drive means adapted to selectively advance the top strand of each of said long belts from said infeed end to said discharge end;

(e) a tilting carriage assembly pivotally mounted interior of said infeed end of said base assembly, said tilting carriage assembly including a support end, an extending end, a first actuator, and a pivot means, said pivot means selectively positioned between said support end and said extending end to provide a predetermined ratio of a top portion of said nested stack to a bottom portion of said nested stack, said support end adapted to accept said stack of nested preformed containers in a substantially vertical array, said first actuator adapted for tilting said tilting carriage assem-

bly with said nested stack thereon from said substantially vertical array to a substantially horizontal array, said pivot means adapted to provide a predetermined spacing between said endless belt radially engaged on one of said driven pulleys and said tilting carriage in a substantially vertical array, said pivot means further adapted for placing said top portion of said nested stack of containers in contact with said advancing long belts when said tilting carriage is brought to said horizontal array, said contact of said top portion of said nested stack with said advancing long belts advancing all of said nested stack toward said discharge end;

(f) a stop member retractibly mounted interior of said trough member, said stop member selectively raised to stop said nested stack advancing on said long belts;

(g) an elongated rail assembly mounted interior of said trough member, said rail assembly extending a selected length from said stop member toward said infeed end;

(h) an actuating means for said elongated rail assembly, said actuating means adapted to selectively move said rail assembly from a retracted position to an up position, said up position for lifting said nested stack off the advancing long belts, said retracted position adapted for allowing said nested stack to be carried and advanced on said long belts;

(i) a container separating assembly mounted to and on said base assembly, said container separating assembly selectively positioned relative to said stop member, said container separating assembly adapted for separating a first container of said nested stack from said nested stack lifted by said elongated rail assembly, said separating assembly further adapted to selectively advance said first container from said elongated rail assembly onto said advancing long belts;

(j) a pivoting hook assembly mounted to said base assembly, said pivoting hook assembly selectively located between said container separating assembly and said discharge end, said pivoting hook assembly adapted for engaging the open mouth of said first container advancing on said long belts, said pivoting hook assembly further adapted for tilting said first container advancing on said long belts from a substantially horizontal array to a substantially vertical array; and

(k) a stabilizer means mounted to said base assembly at said discharge end, said stabilizer means adapted for contacting the mouth of said first container disengaging from said pivoting hook assembly in a substantially vertical array, said stabilizer means maintaining said vertical array of said first container as said first container exits said apparatus.

4,983,099

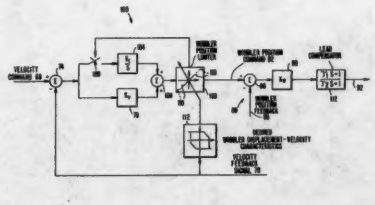
TORQUE-VELOCITY CONTROL FOR VARIABLE DISPLACEMENT HYDRAULIC MOTOR

Shan-chin Tsai, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 19, 1989, Ser. No. 298,751

Int. Cl.[5] F04B *1/20*

U.S. Cl. 417—222 **45 Claims**



1. A control for a variable displacement hydraulic motor comprising:

an electrically controlled hydraulic servo valve for controlling the displacement of the hydraulic motor by varying position of a wobbler in response to a servo valve control signal;

a velocity transducer, coupled to a shaft driven by the motor, for producing a velocity signal representative of the velocity of the shaft;

a controller for producing the servo valve control signal, the controller including a first signal summer which produces an output signal equal to a difference between a velocity command and the velocity signal, the output signal being applied to an integrator and to a proportional amplifier and applied to a second summer to produce a wobbler position command which is a sum of outputs from the integrator and proportional amplifier which is processed by the controller to produce the control signal; and

a limiter which produces a variable limit as a function of the velocity signal, coupled to an output of the second summer, for limiting the wobbler position command to a limit which is a function of the velocity signal.

4,983,100

RADIAL PISTON PUMP

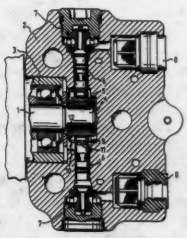
Ludwig Budecker, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

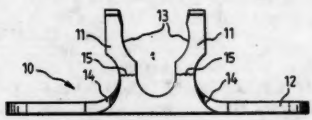
Filed Nov. 27, 1989, Ser. No. 441,797

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1988, 3840691

Int. Cl.[5] F04B *1/04*

U.S. Cl. 417—271 **9 Claims**





1. A radial piston pump comprising:

a cylinder block adapted to be mounted on the housing of an electric motor and having an axial bore;

at least one pair of pistons extending radially of said cylinder block into said axial bore and positioned diametrically opposite to each other;

a drive shaft extending axially of said axial bore in said cylinder block adapted to be connected to said electric motor and having a length which is eccentric relative to said axial bore;

a radial bearing mounted on said length of said drive shaft which is eccentric relative to said axial bore in said cylinder block and contacting said pistons to drive said pistons as said shaft rotates; and

a coupling device having:

(a) a mounting portion for mounting said coupling device on said radial bearing, and

(b) a pair of axial extensions, each of which engage one of said pistons to couple said pistons together and is shaped and dimensioned to break at a selected fracture point upon sensing of a predetermined resistance against radially outward movement of said pistons.

4,983,101

DRIVE MECHANISM FOR PUMPS

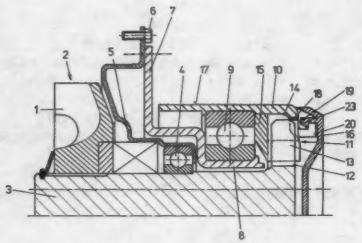
Heinrich Kunkel, and Armin Olschewski, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 24, 1989, Ser. No. 387,493

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825632

Int. Cl.[5] F04B *9/02*

U.S. Cl. 417—362 7 Claims



1. Drive mechanism for pumps, including a housing, a pump rotor mounted in a pump chamber of the housing;

a pump cover (5) covering the pump chamber, the cover having an axially projecting shoulder with a housing bore passing through from the pump rotor to the outside; and

a shaft passing through the housing bore, the shaft being connected in a torsion-proof manner at its inner end to the pump rotor and at its outer end by way of a coupling element to a drive wheel (10), the shaft being supported in an inner bearing (4) seated in the housing bore and the drive wheel (10) being supported on an outer bearing (9), characterized by a plate (7), which is separate from the pump cover (5) whose location on the housing can be selectively varied in a direction radially of said housing bore and on which the bearing (9) for the drive wheel (10) is supported with freedom to rotate.

4,983,102

SELF-ENCLOSED FILTER PUMPING SYSTEM

Danny C. Swain, 1124 Foxhurst Way, San Jose, Calif. 95120

Filed Oct. 14, 1988, Ser. No. 257,768

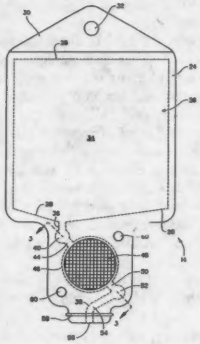
Int. Cl.[5] F04B *43/06*

U.S. Cl. 417—394 20 Claims

1. A fluid pumping system comprising:

a pump shell including a series of pump passages connecting (a) a first location on the exterior of said shell to a first valve cavity, (b) said first valve cavity to a pumping cavity, (c) said pumping cavity to a second valve cavity and (d) said second valve cavity to a second location on the exterior of said shell, a plurality of pneumatic passages connecting said first and second valve cavities and said pumping cavity to respective pneumatic connectors on the exterior of said shell, and pneumatic isolation means for isolating said first and second pneumatic cavities and said pumping cavity from each other and from the surrounding atmosphere;

a one piece unitary fluid bag assembly for insertion into the pump shell, including a container portion for enclosing fluid and an extension portion, said extension portion including a series of fluid flow passages connecting (a) said container portion to a first valve bubble, (b) said first valve bubble to a pump bubble, (c) said pump bubble to a second valve bubble, and (d) said second valve bubble to an outlet port, said fluid flow passages and said bubbles corresponding to said respective pump passages and said cavities of the pump shell and being adapted to mate therewith; and



pneumatic means for selectively delivering positive and negative pneumatic pressure to said first and second valve cavities so as to selectively occlude and open said first and second valve bubbles to correspondingly prevent and permit fluid flow therethrough, and for delivering positive and negative pneumatic pressure to said pump cavity so as to contract and expand said pump bubble in a controlled manner to pump controlled quantities of fluid therethrough.

4,983,103

ANNULAR PLUNGER PUMP

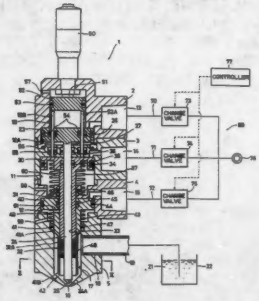
Kenji Ogawa, Musashino, Japan, assignor to Neuberg Company Limited, Japan

Filed Aug. 15, 1989, Ser. No. 394,034

Claims priority, application Japan, Aug. 16, 1988, 63-204515; Mar. 1, 1989, 1-48960

Int. Cl.[5] F04B *17/00*; B67D *1/08*

U.S. Cl. 417—400 6 Claims



1. A pump, comprising a pump body formed with a drawing passageway for drawing a liquid from a supply source and a discharge port means discharging the liquid, the pump body including:

a first valve for opening and shutting the discharge port;
an annular plunger arranged coaxially with said first valve for discharging the liquid through the discharge port;
a second valve arranged coaxially with said annular plunger for opening and shutting the liquid drawing passageway;
each said first valve, plunger and second valve having its own individual drive means so as to be separately movable from each other.

4,983,104
BELLOWS-TYPE PUMP

Kenji A. Kingsford, Devore, and Anthony K. Chan, Alhambra, both of Calif., assignors to Osmonics, Inc., Minnetonka, Minn.

Filed Jun. 23, 1989, Ser. No. 372,444
Int. Cl.[5] F04B *45/02*
U.S. Cl. 417—473 **3 Claims**

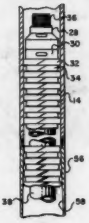
1. In a bellows-type pump for pumping acids and the like, including a pump head defining therein an enlarged chamber, a reciprocal driver including a reciprocal driving rod projecting coaxially into said enlarged chamber, an axially elongate and flexible pumping bellows disposed in surrounding relationship to said driving rod and sealingly connected between said driving rod and said pump head so as to define a pumping chamber between said pumping bellows and opposed walls of said enlarged chamber, said bellows being constructed of a plastics material and at one end having an end wall which extends transversely across the pumping chamber and is fixedly secured to a free end of said driving rod, said bellows at the other end having an annular mounting flange which is fixedly and sealingly secured relative to the pump head, said bellows further including an axially elongate and sleevelike side wall which substantially concentrically surrounds a part of said driving rod and which extends axially between said end wall and said mounting flange, said sleevelike side wall including a plurality of axially adjacent annular coils each having a generally U-shaped cross section which opens radially inwardly, and passage means formed in said pump head and communicating with said pumping chamber for permitting a pumped fluid to be supplied into and discharged out of said pumping chamber during each reciprocal cycle of said pumping bellows, comprising the improvement wherein a split support ring is disposed within the interior of said coil to effect radially outward support of said coil in opposition to the pressurization of the pumped fluid within the pumping chamber, said support ring having a single split defined by opposed free ends which have a male-female interfitting engagement with one another to prevent the opposed ends from being directly sidewardly displaced with respect to one another.

4,983,105
DOWN HOLE PUMP

Joe L. Mims, Sr., 5015 16th St., Lubbock, Tex. 79416

Filed May 25, 1989, Ser. No. 332,783
Int. Cl.[5] F04B *21/04*; F16J *9/08*
U.S. Cl. 417—554 **6 Claims**

1. A reciprocating downhole pump within a working barrel operated by a sucker rod extending between a pumping unit on a ground level and the down hole pump in a well comprising:
a hollow mandrel forming a tubular member with threaded sections on both ends of said hollow mandrel and perforations formed on said mandrel between the threaded sections;
an expandable tube surrounding said hollow mandrel between said threaded sections and covering said perforations, thereby forming a means for communicating hydrostatic pressure existing within said hollow mandrel on an upstroke of said pump to expand said expandable tube;
a plurality of special expandable rings which surround said expandable tube, said expandable tube causing said expandable rings to expand radially with said expandable tube so as to maintain constant contact with an interior surface of said working barrel;

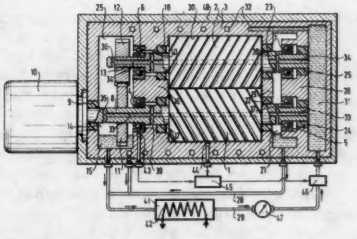


a plurality of expandable spacers also surrounding and expanding with said expandable tube between each of said expandable rings having a significantly smaller outside diameter than said expandable rings, said spacers remaining free of contact with said working barrel so as to form a space between each of said expandable rings to trap fluid in said space thereby acting as a lubricating source;
and a plurality of adjustable retainers fitting onto each of said threaded sections so as to axially secure said plurality of spacers and expandable rings.

4,983,106
ROTARY SCREW MACHINE WITH MULTIPLE CHAMBERS IN CASING FOR LUBRICATION-CODING FLUID

Dan Wright; Allan Riach, both of Glasgow, United Kingdom; Jean-Marie Crinquette, Annecy le Vieux, France; René Sibuet, and Jacques Long, both of Annecy, France, assignors to Societe Anonyme dite: Alcatel Cit, Paris, France

Filed Oct. 4, 1989, Ser. No. 417,115
Claims priority, application France, Oct. 7, 1988, 88 13193
Int. Cl.[5] F04C *29/02, 29/04*
U.S. Cl. 418—2 **3 Claims**



1. A dry vacuum screw pump rotary machine comprising: a stator casing, a cavity within said casing, a drive motor, a first rotor and a second rotor having conjugate screws and supported by bearings inside said stator casing cavity and enclosing the rotors, a suction inlet communicating with the cavity at one end of the rotors, a delivery outlet communicating with said cavity at the other end of the rotors, the first rotor being connected to said drive motor for rotating said first rotor, synchronizing gearing situated in a first chamber of said casing

and lying between said motor and one of the ends of said rotors and coupled to said first and second rotors, said synchronizing gearing running in a lubricating fluid, the cavity of the casing containing said rotors being separated from said first chamber containing said gearing by a first wall, said rotors having rotor shafts, the shafts of said rotors passing via seals through said first wall, the shafts of the rotors at the opposite end of the rotors to the end having said gearing passing through a second wall via seals, and wherein said casing comprises, beyond said second wall, a second chamber, a main pipe connecting said second chamber to said first chamber, pumping means within said main pipe, the rotors and the stator-casing including fluid circulation channels extending from said second chamber to said fist chamber, said pipe having a heat exchanger disposed in the path of said pipe to cool said lubricating fluid circulated by said pumping means whereby said stator and said rotors may be maintained at near equal temperature with reduced clearance between the rotors and the stator.

4,983,107

MULTISTAGE ROTARY PISTON VACUUM PUMP HAVING SLEEVES TO FIX SHAFT POSITIONS

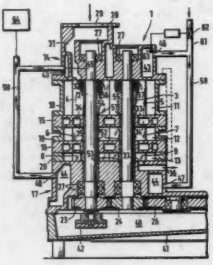
Ralf Steffens; Hans-Peter Kabelitz; Hanns-Peter Berges, all of Cologne, and Wolfgang Leier, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,559

Claims priority, application European Pat. Off., May 15, 1987, 87107090.0

Int. Cl.[5] F04C *25/02, 29/04*

U.S. Cl. 418—9 **15 Claims**



1. A multi-stage twin-shaft vacuum pump, comprising:

(a) a multi-stage pump chamber,

(b) a pair of generally vertically disposed shafts and a pair of rotary pistons disposed in each stage of said multi-stage pump chamber, each said pair of rotary pistons being supported by a respective one of said shafts, each said shaft having a sleeve thereon to fix the position of the respective said shaft in said multi-stage pump chamber, each said sleeve being composed of a material having a coefficient of expansion which is lower than that of the material forming said rotary pistons,

(c) upper and lower end plates which laterally delimit said pump chamber, and intermediate end plates, said sleeves surrounding the respective said shafts at the level of said intermediate end plates and at the level of said lower end plate,

(d) a housing ring which peripherally delimits said pump chamber,

(e) said housing ring and said rotary pistons being composed of different materials, the coefficient of expansion of the piston material being lower than the coefficient of expansion of the housing material.

4,983,108

LOW PRESSURE CONTAINER TYPE ROLLING PISTON COMPRESSOR WITH LUBRICATION CHANNEL IN THE END PLATE

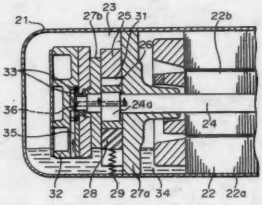
Susumu Kawaguchi; Yoshinori Shirafuji; Hideaki Maeyama; Tatsuya Sugita, and Takashi Yamamoto, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

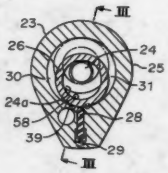
Filed Sep. 26, 1989, Ser. No. 412,409

Claims priority, application Japan, Sep. 28, 1988, 63-242837; Apr. 26, 1989, 1-106626

Int. Cl.[5] F04C *29/02*

U.S. Cl. 418—63 **4 Claims**





1. A low pressure container type rolling piston compressor which comprises:

a compression side,

a motor side,

a rotary shaft having an eccentric portion driven by said motor element,

within said compression side is disposed a cylinder having opposite open ends and receiving therein said eccentric portion of the rotary shaft,

and a rolling piston having an inner circumference with which said eccentric portion is fitted and an outer circumference which engages with an inner wall surface of said cylinder,

a vane connected to said cylinder and having an end which is in contact with the outer circumference of said rolling piston to divide the inner space of said cylinder into a high pressure chamber and a low pressure chamber.

a pair of bearing plates for closing the opposite open ends of said cylinder,

a sealing container for housing the cylinder and storing at a lower part of said sealing container a lubricating oil wherein pressure in said sealing container is substantially the same as that in said low pressure chamber,

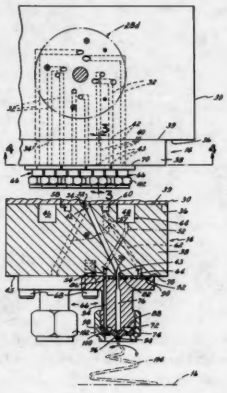
oil supplying groove means formed in an inner surface of one of said pair of bearing plates for communicating said low pressure chamber with an inner space of the rolling piston and means for supplying lubrication oil from said lubrication storage to said innerspace.

4,983,109

SPRAY HEAD ATTACHMENT FOR METERING GEAR HEAD

Scott R. Miller, Roswell; John M. Raterman, and Roger A. Ziecker, both of Lawrenceville, all of Ga., assignors to Nordson Corporation, Westlake, Ohio

Filed Jan. 14, 1988, Ser. No. 143,829
Int. Cl.[5] B05B *1/16, 1/34*
U.S. Cl. 425—7 11 Claims



1. Apparatus for spraying hot melt adhesive onto the backing sheet of a hygienic article, comprising:

a flow metering device having means for discharging a separately metered quantity of hot melt adhesive through each of a plurality of outlets;

a manifold mounted to said flow metering device, said manifold being formed with adhesive connector passageways each having an inlet communicating with one of said outlets of said flow metering device and an outlet formed on a discharge surface of said manifold, said manifold being formed with air connector passageways each having an inlet adapted to connect to a source of pressurized air and an outlet formed on said discharge surface of said manifold, said outlets of said adhesive connector passageways and said outlets of said air connector passageways being arranged in arrays on said discharge surface of said manifold each consisting of an outlet of one adhesive connector passageway and an outlet of one air connector passageway;

a nozzle mounted to said discharge surface of said manifold over one of said arrays of an adhesive connector passageway outlet and an air connector passageway outlet, said nozzle being formed with an adhesive discharge passageway connected to said outlet of said adhesive connector passageway and an air discharge passageway connected to said outlet of said air connector passageway;

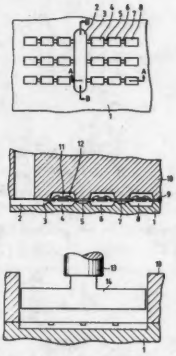
a nozzle attachment mounted to said nozzle, said nozzle attachment being formed with a throughbore connected to said adhesive discharge passageway of said nozzle for discharging a bead of adhesive, said nozzle attachment being formed with air jet bores connected to said air discharge passageway of said nozzle for directing pressurized air substantially tangent to the outer periphery of said bead of adhesive to form elongated adhesive fibers and to impart a twisting motion to said elongated adhesive fibers for deposition in a spiral spray pattern on the backing sheet of a hygienic article.

4,983,110

RESIN ENCAPSULATING APPARATUS FOR SEMICONDUCTOR DEVICES

Isamu Yoshida; Junichi Saeki, both of Yokohama; Shigeharu Tsunoda, Fujisawa; Kunihiko Nishi, Tokyo, and Masao Mitani, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 323,497
Claims priority, application Japan, Mar. 14, 1988, 63-58257; Apr. 7, 1988, 63-83978
Int. Cl.[5] B29C *45/02, 45/14, 45/32;* B29L *31/34*
U.S. Cl. 425—116 7 Claims



1. A resin encapsulating apparatus for semiconductor devices, including:

a rectangular pot for receiving an encapsulating resin comprising two opposed wall surfaces of short side each having an outwardly projecting curved surface, and two opposed wall surfaces of long side substantially in the form of a straight line;

a plurality of cavity lines and gates connected respectively to the bottom portion of at least one of said long-side wall surfaces of said pot, said cavity lines comprising cavities connected in series through the gate; and,

a plunger to be inserted into said pot whereby resin may be urged by the plunger from the pot to the cavities through the gate to encapsulate semiconductor devices disposed in the cavities.

4,983,111

DEVICE FOR RESIN SEALING SEMICONDUCTOR DEVICES

Yasutsugu Tsutsumi; Sueyoshi Tanaka; Tatsuro Takahashi; Yutaka Morita; Hideaki Suezaki, and Hiromichi Yamada, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 219,483, Jul. 15, 1988, Pat. No. 4,915,608. This application Dec. 8, 1989, Ser. No. 447,866
Claims priority, application Japan, Jul. 20, 1987, 62-180297; Jul. 27, 1987, 62-187317; Jul. 27, 1987, 62-187318; Jul. 27, 1987, 62-187319; Jan. 28, 1988, 63-17876
Int. Cl.[5] B29C *45/14*
U.S. Cl. 425—110 3 Claims

1. A device for resin sealing semiconductor devices comprising:

a press machine having a pair of opposed press surfaces for applying a compressive force to said press surfaces;

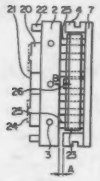
a base disposed on each of said press surfaces and opposed to each other;

a retention board fixed to each of said bases;

spacer blocks disposed between the respective retention boards and bases;

a chase block disposed on each of said retention boards having cavities for accommodating semiconductor devices and recesses facing the respective retention board;

a plurality of posts disposed between said respective retention boards and chase blocks and partially within the recesses in said chase blocks for supporting said chase blocks and undergoing elastic compressive deformation during pressing together of said chase blocks by said press



machine, said posts having lengths between said respective retention boards and said chase blocks sufficient to maintain clearance between said retention boards and said chase blocks when said posts are elastically deformed during the application of a compressive force between said chase blocks of said press machine; and

plastic injection means for injecting plastic into the cavities of said chase blocks.

4,983,112

INTERLOCKING DEVICE FOR HOT ISOSTATIC PRESSURIZING EQUIPMENT

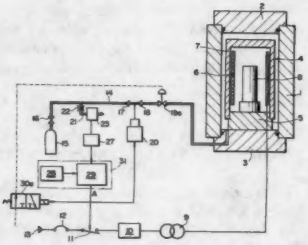
Katsuhiro Uehara; Takahiko Ishii; Takao Fujikawa; Kuniaki Kanda, all of Kobe, and Yutaka Narukawa, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 20, 1989, Ser. No. 382,267

Claims priority, application Japan, Jul. 30, 1988, 63-191594; Jan. 21, 1989, 1-12754

Int. Cl.[5] B22F *3/14*

U.S. Cl. 425—136 **13 Claims**



1. An interlocking device for a hot isostatic pressurizing equipment which includes a high pressure vessel, a furnace in said high pressure vessel, a processing gas pipe system for supplying processing gas into said high pressure vessel, and an opening and closing valve interposed in said processing gas pipe system, comprising a processing gas sampling pipe connected to said processing gas pipe system, an oxygen concentration sensor provided in said processing gas sampling pipe for detecting a concentration of oxygen in said processing gas, and an interlocking means operable when said oxygen concentration sensor detects an oxygen concentration higher than a predetermined level for closing said opening and closing valve in said processing gas pipe system and disconnecting a power source for said furnace in said high pressure vessel.

4,983,113

EXTRUDER HEAD ASSEMBLY

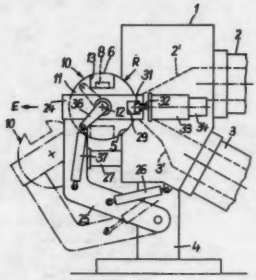
Ingo Hirschkorn, Neu Wulmstorf, Fed. Rep. of Germany, assignor to Fried, Krupp Gesellschaft mit Beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Nov. 13, 1989, Ser. No. 434,462

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838877

Int. Cl.[5] B29C *47/08*

U.S. Cl. 425—183 **7 Claims**



1. An extruder head assembly comprising

(a) an extruder head having an abutment face and an internal flow channel terminating at the abutment face;

(b) first and second preforming dies;

(c) a preforming die drum having receiving means for removably accommodating the first and second preforming dies in a spaced relationship to one another;

(d) means for supporting the drum at said extruder head for rotation about an axis relative to said extruder head for selectively aligning one of the first and second preforming dies with the internal flow channel at said abutment face; said axis being spaced from said abutment face and being generally parallel thereto; and

(e) releasable immobilizing means having a clamping state for pressing the drum against said abutment face thereby placing said one of the first and second preforming dies in an operative position.

4,983,114

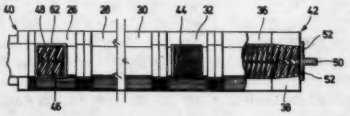
INLET FOR TWIN SCREW EXTRUDER

Bobbie W. Hauck, Sabetha, Kans., assignor to Wenger Manufacturing, Inc., Sabetha, Kans.

Continuation of Ser. No. 386,570, Jul. 27, 1989, abandoned. This application Aug. 10, 1990, Ser. No. 565,901

Int. Cl.[5] B29B *7/48, 7/60, 7/84*

U.S. Cl. 425—203 **7 Claims**



1. In an extruder for processing material to form an extruded product, the extruder including an elongated extruder barrel having material inlet end and an outlet end remote from the inlet end, an inlet opening adjacent the inlet end of the extruder, first and second parallel bores extending axially along the barrel in communication with one another and defining parallel central longitudinal axes, and a pair of elongated, flighted extrusion screws for moving material from the inlet

end towards and through the outlet end, the bores each being formed of a first predetermined diameter and the screws being formed of a second predetermined diameter which is substantially equal to the first diameter while being enough smaller than the first diameter to permit movement of the screws relative to the bores, the screws extending through the bores and being rotatable in the same direction as one another relative tot he barrel such that a first one of the screws tends to pull material in a direction downward and outward away from the inlet opening while a second one of the screws tends to pull material in a direction upward and inward toward the inlet opening, wherein the improvement comprising:

each of the bores being provided with at least one continuous helical groove formed in the bore and configured to propel material in the barrel in a direction towards the outlet end, the at least one helical groove extending along the length of the inlet opening and beyond the inlet opening by a predetermined distance,

the extruder further comprising flow preventing means for preventing material traveling through the at least one continuous helical groove of the second bore from being passed back out of the inlet opening by the second one of the screws during rotation of the screws,

the flow preventing means including a region of the second bore within which the groove is interrupted, the region extending circumferentially at least partially between a horizontal plane that is coplanar with the central longitudinal axes of the bores and the inlet opening, and axially along the length of the inlet opening.

4,983,115

MOLDING APPARATUS FOR SEALING SEMICONDUCTOR DEVICES INCLUDING A MOLD CLEANING DEVICE

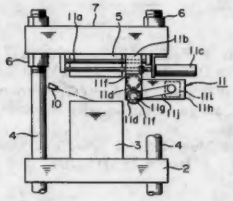
Katuhiko Yamasaki; Minoru Tanaka, and Kenichiro Sakamoto, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 12, 1988, Ser. No. 256,466

Claims priority, application Japan, Oct. 19, 1987, 62-264155

Int. Cl.[5] B29C *45/02, 45/17*

U.S. Cl. 425—228 **4 Claims**



4. A molding apparatus for sealing a semiconductor device in a resin comprising:

a first platen;

a second platen which opposes said first platen;

a first mold half secured to said first platen and having a first molding surface opposing said second platen;

a second mold half secured to said second platen and having a second molding surface opposing said first platen;

a support frame mounted on said first platen for movement parallel to said first molding surface;

a first brush journalled by said support frame for movement towards and away from the molding surface of said first mold half;

a second brush eccentrically journalled by said frame; and

brush drive means for rotating said first brush while cyclically moving it towards and away from said first molding surface and for rotating said second brush while cyclically moving it towards and away from said second molding surface, said brush drive means comprising a first gear secured to said first brush for rotation therewith and a second gear secured to said second brush for rotation therewith and engaging with said first gear.

4,983,116

SECONDARY INJECTION MOLDING MACHINE FOR HOLLOW MOLDED PRODUCTS

Kouhei Koga, Komoro, Japan, assignor to Nissei ASB Machine Co., Ltd., Japan

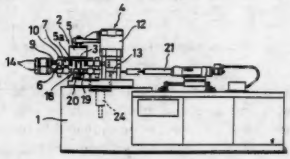
PCT No. PCT/JP88/01195, § 371 Date Jul. 25, 1988, § 102(e) Date Jul. 25, 1988, PCT Pub. No. WO89/04752, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 25, 1988, Ser. No. 391,572

Claims priority, application Japan, Nov. 25, 1987, 62-296411

Int. Cl.[5] B29C *49/20*

U.S. Cl. 425—517 **7 Claims**



1. A secondary injection molding machine for molding an additional piece to a previously molded hollow molded product, the secondary injection molding machine comprising:

a support member which is movable up and down and is movable also between a first and second position; a molded product holding device for holding the molded product, the holding device being mounted on the support member to be moved between the first and second positions;

a clamping mechanism adjacent to the holding device, the clamping mechanism including an upper clamping plate above the molded product and above the holding device;

a secondary injection mold mounted on the clamping mechanism, the secondary mold having a first mold cavity shaped to the shape of the previously molded hollow molded product and having a secondary molding cavity communicating with the first cavity, the secondary cavity being shaped for receiving additional molding material and for molding the additional piece on the molded product;

the clamping plate being moveable vertically upwardly for opening the cavities of the secondary mold and downwardly for closing the cavities of the secondary mold;

in the support member first position, the holding device holds the molded product out from under the clamping plate and out of the first mold cavity, and in the support member second position, the support member has moved the holding device and the molded product so that the molded product is in the first cavity;

the molded product holding device further including a blow core for communicating air into the molded product; an air blowing device positioned to be connected to the blow core when the previously molded product is in the first molding cavity for blowing air through the blow core into the molded product;

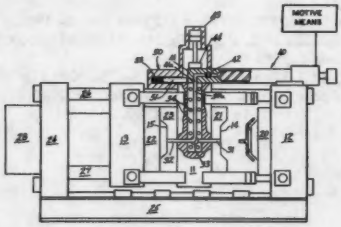
an injection device disposed on the machine and selectively moveable to communicate into the secondary molding cavity for delivering molding material to the secondary molding cavity when the holding device is holding the previously molded product and the air blowing device i delivering air through the blow core into the molded product.

4,983,117

ANTI-DROOL INJECTION MOLDING APPARATUS

Stefan von Buren, Toronto, and Anton S. Paulovic, Bolton, both of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Dec. 26, 1989, Ser. No. 456,542
Int. Cl.[5] B29C *45/23*
U.S. Cl. 425—563 7 Claims



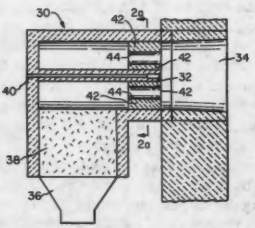
1. An injection molding apparatus which comprises: a first machine platen and a second machine platen spaced from the first machine platen; a center section located between said first and second machine platens; at least one mold cavity adjacent the center section; a hot runner system located in the center section communicating with said at least one mold cavity; an injection unit comprising an injection nozzle engagable with said runner system for feeding molten plastic to said runner system and said at least one mold cavity; means to engage and disengage said injection unit from said runner system; and access means for closing said runner system when the injection unit is disengaged therefrom and for opening said runner system for engagement with said injection unit, wherein said injection unit is operative to move said access means away from said runner system for engagement of the injection unit with said runner system.

4,983,118

LOW NOX REGENERATIVE BURNER

James E. Hovis, and Harry P. Finke, both of Allegheny County, Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Mar. 16, 1988, Ser. No. 168,892
Int. Cl.[5] F27D *17/00*
U.S. Cl. 431—115 2 Claims



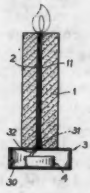
1. In a regenerative burner having a regenerative bed, a burner port and a fuel nozzle, the improvement comprising: a burner baffle having apertures therein for selectively directing combustion air and inducing combustion gas recirculation into a primary combustion zone for suppressing NOx emissions, said baffle and said fuel nozzle being positioned substantially adjacent said burner port and being substantially coplanar in a plane perpendicular to a burner axis.

4,983,119

MUSICAL CANDLE ACTUATED BY THERMISTOR SWITCH

Wen-Tsung Lin, P.O. Box 74-9, Taipei, Taiwan

Filed Mar. 26, 1990, Ser. No. 498,715
Int. Cl.[5] F23D *3/02*
U.S. Cl. 431—253 4 Claims



1. A musical candle comprising:
a candle having a wick longitudinally formed in said candle;
a base casing formed under said candle for holding said candle thereon;
a musical device having a musical integrated circuit and a trigger pin, mounted in said base casing and having a power source for powering said musical integrated circuit; and
a longitudinal thermistor switch including a means for changing its internal resistance formed in said candle juxtapositional and proximate to said wick and electrically connected between said power source and said trigger pin of said musical integrated circuit of said musical device,
whereby upon a burning of said wick and said thermistor switch, said thermistor switch is actuated to reduce its internal resistance to conduct a current from said power source for triggering and sounding said musical integrated circuit, and upon an extinguishing of a burning flame of the candle, the thermistor is cooled to recover its resistance to disconnect the power supply to said musical integrated circuit for stopping a music sounding.

4,983,120

METHOD AND APPARATUS FOR CONSTRUCTING AN ORTHODONTIC APPLIANCE

Angus C. Coleman, Upland, and Scott G. Newhart, Los Angeles, both of Calif., assignors to Specialty Appliance Works, Inc., Atlanta, Ga.

Filed May 12, 1988, Ser. No. 192,909
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—24 4 Claims

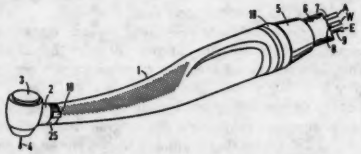
3. A method for constructing an orthodontic appliance to be placed in a patient's mouth so as to effectuate the desired tooth repositioning, comprising the steps of:
(a) forming a model of a patient's malocclusion;
(b) establishing a locating groove of each tooth of said patient's malocclusion;
(c) moving said teeth into their prescribed positions on said support;
(d) establishing the desired arch form for said teeth; and

(e) placing orthodontic brackets on said teeth in accordance with said desired arch form using said locating groove.

4,983,121
DENTAL HANDPIECE

Reinhard Straihammer; Werner Schuss, both of Heppenheim; Siegfried Golsser, Einhausen, and Lutz Beerstecher, Darmstadt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 159,754
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706263; Dec. 15, 1987, 3742497
Int. Cl.[5] A61C *1/10*
U.S. Cl. 433—114 **16 Claims**



1. In a dental handpiece having a head part with a head housing with a gripping sleeve extending from the head part, said handpiece having at least one drive shaft section and bearing means for supporting the drive shaft section in the interior of the handpiece, said drive shaft section having means for coupling to a drive unit and said handpiece having at least one agent line for conveying an agent the length of the dental handpiece, the improvement comprising said handpiece containing a base member arrangement having an interior passage receiving the drive shaft section and bearing means for supporting the drive shaft section, said base member arrangement at one end having means for releasably receiving said head part with the head housing, said base member arrangement having an outer surface with supporting and holding elements for securing each agent line to extend along the outer surface of the base member arrangement, said base member arrangement having a supporting location with a connecting part adjacent each end, said connecting part at said one end including a carrying part adjacent the head part, said carrying part accepting an end of each agent line having a shape for surrounding a portion of the base member arrangement and an outer contour of said carrying part extending flush with neighboring surfaces of the handpiece, said gripping sleeve having a first end and a second end, said sleeve being free of any retaining and elements for each agent line and being removably received over the base member arrangement and being in contact with the outer surface of said base member arrangement only at each of the supporting locations, said connecting parts axially clamping the gripping sleeve therebetween with said contact being in the regions of said first and second ends to form an annular interspace between an interior surface of the gripping sleeve and the outer surface of the base member arrangement in which each agent line can extend unimpeded.

4,983,122
DENTAL COMPRESS

Neal I. Mitnick, 5118 14th Ave., Brooklyn, N.Y. 11219

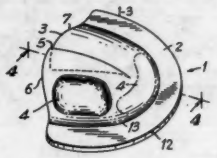
Filed Mar. 3, 1989, Ser. No. 319,478
Int. Cl.[5] A61C *19/06*; A61F *7/12*
U.S. Cl. 433—229 **36 Claims**

1. A device for use as a hot or cold compress, comprising:

a sealed, flexible enclosure sized to be insertable into a mouth;

a non-toxic temperature storage medium contained within said enclosure, said storage medium having a gel-like consistency over a wide temperature range; and

means for engaging said enclosure and for holding said enclosure against a surface in the mouth, said means being

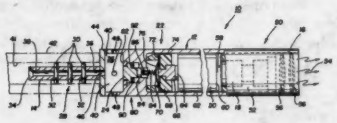


configured to be insertable into the mouth and not to be easily aspirated.

4,983,123
MARKSMANSHIP TRAINING APPARATUS

Bentley N. Scott, Richardson, and Samuel R. Shortes, Lewisville, both of Tex., assignors to Phase Dynamics, Inc., Richardson, Tex.

Filed Nov. 6, 1989, Ser. No. 431,902
Int. Cl.[5] F41G *3/26*
U.S. Cl. 434—21 **20 Claims**



1. Marksmanship training apparatus for a weapon having a barrel with a bore and a firing mechanism for causing gas to be propelled down the bore, said marksmanship training apparatus comprising:

an electrically conductive housing member having a first end and a second end;

a muzzle alignment tube having a passageway therethrough and being operatively attached to the second end of said electrically conductive housing member, said muzzle alignment tube being structured to be capable of being inserted into the bore of the barrel;

sealing means positioned around said muzzle alignment tube at a predetermined position to minimize gas being propelled down said bore from passing between the muzzle alignment tube and the bore and to prevent the muzzle alignment tube from being pushed out of said bore by said gas;

a chamber formed in the second end of said electrically conductive housing member and having an entry port to receive gas propelled down said bore and said muzzle alignment tube;

energy emitting means disposed in said electrically conductive housing member and positioned to emit energy from said first end of said electrically conductive housing member when activated;

a power source disposed within said electrically conductive housing member and connected to said energy emitting means; and

energy activation means positioned within said electrically conductive housing member and electrically connected to complete an electrical circuit through said energy emitting means, said electrically conductive housing member, said power source and said energy activation means when said energy activation means is activated to the on position when said gas enters said chamber.

4,983,124

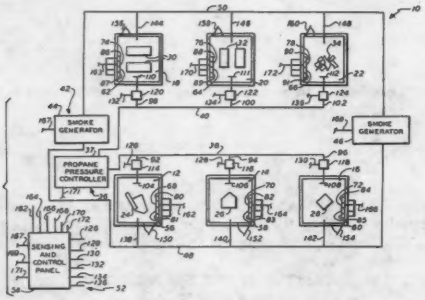
FIRE FIGHTING TRAINER

James J. Ernst, Livingston; Steven Williamson, Haledon; George Rogers, Linden, and Dominick J. Musto, Middlesex, all of N.J., assignors to Symtron Systems, Inc., Fairlawn, N.J.

Continuation-in-part of Ser. No. 238,453, Aug. 30, 1988, Pat. No. 4,861,270. This application Aug. 9, 1989, Ser. No. 387,348

Int. Cl.[5] G09B 9/00

U.S. Cl. 434—226 8 Claims



1. A fire fighting trainer comprising:

One pr more chambers having contents including a series of items chosen from a group of simulated burnable items including at least furniture and fixtures and equipment;

a smoke generating means having an outlet disposed in the chamber;

a flame generating means having an outlet disposed in the chamber;

a sensing and control means having a series of multi-sensor assemblies disposed in the chamber and connecting to a main control panel; wherein said multisensory assemblies each includes

a water sensor portion and

a foam sensor portion and a powder sensor portion; and wherein said chamber has a floor grating and a space disposed below the grating, and wherein the flame generating means includes multi-element and single element burner units disposed in said space and having a series of elongate elements respectively disposed above the series of multi-sensor assemblies and within the space.

4,983,125

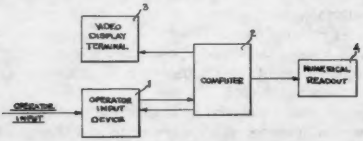
DEVICE FOR MEASURING HUMAN PERFORMANCE

James C. Smith, Santa Monica; R. Wade Allen, Hermosa Beach, and Henry R. Jex, Santa Monica, all of Calif., assignors to Systems Technology, Inc., Hawthorne, Calif.

Continuation-in-part of Ser. No. 157,240, Feb. 10, 1988, abandoned. This application Nov. 1, 1989, Ser. No. 430,490

Int. Cl.[5] G09B 19/00

U.S. Cl. 434—258 6 Claims



5. A device for measuring the level of the ability of a human operator to stabilize an inherently unstable system so as to maintain an output signal within a preset display limit wherein the difficulty of maintaining stabilization of the device is increased from a first preselected level of instability to a second preselected level of instability said second level being defined as a tracking level and then held at the second preselected level and the number of times that the operator loses control of the device during a preselected period of time is used as a measurement of such level of ability, comprising:

a microprocessor;

an output display device;

an operator control device;

the microprocessor, by means of an adjustable multiplicative factor within a positive computational feedback loop, providing an adjustably unstable output signal responsive to the input by the human operator to the operator control device: the size of the multiplicative factor determining the degree of the instability exhibited by the positive computational feedback loop; the size of the multiplicative factor being dynamically adjustable;

multiplicity factor control means for dynamically adjusting the size of the multiplicative factor;

the output display device providing a visual display of the output signal from the microprocessor, the display of which output signal tends to diverge from a zero reference;

said operator control device including means for inputting a human operator controlled input signal from the operator control device to the computer to counteract the divergence of the displayed output signal from the zero reference;

means for gradually increasing the level of instability from the first preselected level to the second preselected level after which the level of instability is maintained constant until the human operator fails to maintain the output signal within preselected limits on the output display device;

means for recycling the level of instability to the first preselected level of instability and increasing the level of instability from the first preselected level of instability to the second preselected level each time the human operator fails to maintain the output signal within the preselected limits on the output display device.

means for monitoring and recording the number of times that the human operator fails to maintain the output signal within preselected limits on the output display device during a preselected period of time.

4,983,126

APPARATUS FOR ELECTRICAL CONNECTION OF INSERTABLE ELECTRICAL ASSEMBLIES

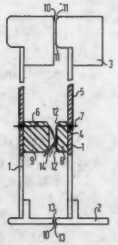
Ingeborg Busse, and Eduard Mair, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 527,424

Claims priority, application Fed. Rep. of Germany, Jun. 17, 1989, 3919586

Int. Cl.[5] H01R 9/09

U.S. Cl. 439—61 15 Claims



1. Connection apparatus for electrically connecting printed circuit boards which are insertable in a predetermined direction into a magazine, comprising:

first and second neighboring printed circuit boards each including

edges, a first surface facing the like first surface of the other printed circuit board and an opposite, second surface;

circuit interconnects carried on said second surfaces;

a pair of front covers each mounted on a first edge of a respective printed circuit board;

a pair of electrical connectors each mounted on a second edge of respective printed circuit board opposite the respective front cover;

a first contact carried by said first printed circuit board electrically connected to a respective circuit interconnect thereof and including a first contact portion facing said second printed circuit board and at a predetermined distance from said first surface of said first printed circuit board; and

a second contact carried by said second printed circuit board electrically connected to a respective circuit interconnect thereon and including a contact portion facing said first printed circuit board for engagement with said first contact portion.

4,983,127

ELECTRICAL CONNECTOR

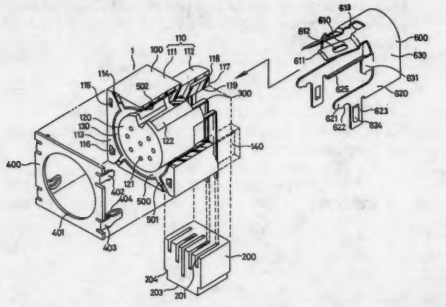
Mitsuru Kawai; Masaru Yoshida, and Yoshihiro Sasaki, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,626

Claims priority, application Japan, Oct. 4, 1988, 63-129622[U]

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—79 **5 Claims**



1. An electrical connector comprising an insulating housing, a metal hood member, and a plurality of contact elements mounted within said insulating housing, characterized in that

said contact elements have a contact portion for contact with a mating contact element within said insulating housing, an intermediate portion extending rearwardly from said contact portion, and a terminal portion extending downwardly from said intermediate portion through said insulating housing;

said insulating housing has an annular recess for receiving a mating shell member, a rear cavity for receiving a block member for supporting said intermediate portions of contact elements within said hood member;

said hood member has a pair of leg members to be connected to a ground circuit on a printed circuit board and a pair of flanges extending inwardly from lower edges thereof for supporting said block member; and that

said block member has lateral channels for receiving said intermediate portions of contact elements and vertical apertures through which said terminal portions of contact elements are pass.

4,983,128

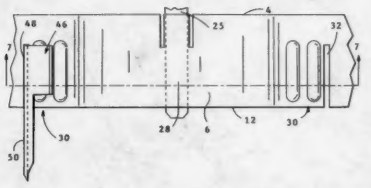
BUS BAR FOR MAKING ELECTRICAL TAPS

James L. Dale; Vernon R. Miller, both of Atlanta, and Lincoln E. Roberts, Decatur, all of Ga., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 28, 1989, Ser. No. 399,740

Int. Cl.[5] H01R *27/02*

U.S. Cl. 439—214 **22 Claims**



1. An electrical connecting device having at least one receptacle portion opening which is intended to receive a male contact member, the connecting device comprising:

a folded sheet metal generally U-shaped member having a bight portion and arms extending from the bight portion, the arms having opposed internal surfaces, oppositely facing external surfaces, and distal ends, the internal and external surfaces being rolled surfaces, the spacing between the internal surfaces being less than the thickness of the male contact member, said arms lying in parallel planes and each of the arms is severed along two severed lines which extend from the opening partially towards the distal ends of the arms, the severed lines defining an ear in each arm having a free end which is proximate to the opening and a fixed end which is integral with, and extends from, the associated arm at a location between the opening and the distal end, the ears extending divergently from their fixed ends to their free ends whereby the ears have opposed convergent surfaces which serve as guiding surfaces for the male contact member,

the connecting device having opposite ends, the bight portion and the arms extending between the opposite ends, the receptacle portion comprising said contact receiving opening in the bight portion, the opening being between, and spaced from, the opposite ends,

the bight portion being plastically deformed and work hardened, the arms being resiliently deformable in directions which extend normal to the planes of the arms whereby, upon insertion of the male contact member into the contact receiving opening, the opposed internal surfaces are urged apart by the male contact member and the arms are bowed in the vicinity of the receptacle portion by the male contact member whereby electrical contact between the male contact member and the connecting device is established and maintained.

4,983,129

CONTACT MEMBER

Karl O. Karlsson, Hägersten; Alf T. Westerlund, Örnsköldsvik, and Gunnar S. Fransson, Enskede, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE89/00175, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO89/12335, PCT Pub. Date Dec. 14, 1989

PCT Filed Apr. 5, 1989, Ser. No. 458,627

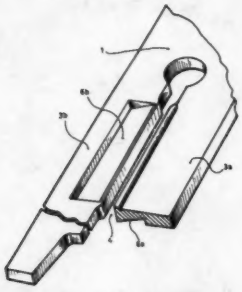
Claims priority, application Sweden, Jun. 1, 1988, 8802043

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—395 **6 Claims**

1. A contact member, comprising a bifurcated part including two legs, and an intermediate slit extending in a first direction between said legs, said bifurcated part for being thrust transversely onto an insulated conductor to penetrate the insulation

and make electrical contact with the conductor, said bifurcated part being stamped at a contact region for contacting the conductor such that a material of said legs is deformed plastically towards said slit so that said slit is given correct width



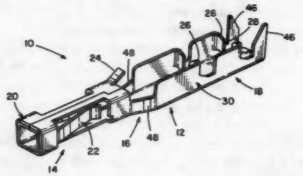
and tolerance in relation to the conductor, wherein said material in said legs is deformed such that side surfaces of said slit are mutually parallel and are thicker than said legs in a second direction which is generally perpendicular to said first direction.

4,983,130

INSULATION DISPLACEMENT CONTACT

Jack E. Caveney, Hinsdale; John J. Bulanda, New Lenox, and Russell E. Wende, Oak Lawn, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Oct. 9, 1985, Ser. No. 785,817
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—407 **5 Claims**



1. An insulation displacement contact adapted for post-termination insertion and retention within a channel of an insulative connector housing, comprising:

a floor extending the length of said contact;

a terminal engagement portion formed at one end of said floor which is adapted for mating engagement with a terminal;

a conductor termination portion integrally formed at the opposite end of said floor including opposing first walls coextensive with said floor and opposing insulation displacement jaws, each jaw formed from a portion of one of said first walls and each jaw including a first lateral edge and a coextensive second lateral shear edge, and wherein a wall shear edge is disposed in each of said first walls with said second lateral shear edges and said wall shear edges inclined towards said floor; and

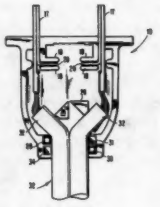
a transition portion having opposing transition walls integrally connected to said first walls and converging therefrom to integral connection with said terminal engagement portion, said floor, said first walls, and said transition walls together forming a continuous integral channel that extends from said terminal engagement portion to the opposite end of said contact whereby said contact is strengthened to resist axial deformation during termination or post-termination insertion of the contact into a connector housing.

4,983,131

PRE-MOLDED ELECTRICAL PLUG BODY

Bernardo L. Esteban, and Efrain B. Hernandez, both of Guanajuato, Mexico, assignors to Woods Wire Products, Inc., Carmel, Ind.

Filed Jan. 11, 1990, Ser. No. 463,420
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—456 **9 Claims**



1. A pre-molded electrical plug body to house male electrical blades and electrical plug wires, comprising

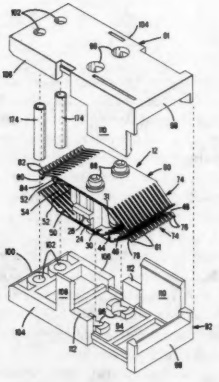
a pair of identical pre-molded electrical plug body pieces mated together, each piece having blade receiving means for snugly receiving male electrical blades, a pair of posts nested together with corresponding posts of the mating piece to form a central pillar around which electrical plug wires are led to the male electrical blades, and a pair of pins received into corresponding recesses of the mating piece that cooperate with said pair of posts to arrest therebetween electrical plug wires led to the male electrical blades.

4,983,132

CONNECTOR FOR MATING BUS BARS

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1989, Ser. No. 451,471
Int. Cl.[5] H01R *11/09*
U.S. Cl. 439—786 **7 Claims**



1. An electrical connector for mating two blade shaped members, each having opposed first and second sides, said connector comprising:

a dielectric spacer member having opposed major surfaces;

a first terminal element and at least a second terminal element secured to each of said opposing major surfaces of said spacer member for electrical interconnection of first and second electrical articles at leading and trailing edges respectively, said first terminal element being adjacent said spacer member and said second terminal element disposed outwardly of said first terminal element; and

means insulating associated said first and second terminal elements from each other;

each said first terminal element including a body section having first and second arrays of cantilevered spring contact arms extending outwardly from respective leading and trailing edges thereof, said contact arms of both said first and second arrays of each said first terminal element extending to respective free ends outwardly from the plane of the respective said body section toward the other first terminal element, said first and second arrays defining first and second blade-receiving receptacles respectively therebetween;

each second terminal element including a body section having third and fourth arrays of cantilevered spring contact arms extending outwardly from respective leading and trailing edges thereof, said contact arms of both said third and fourth arrays of each said second terminal element extending to respective free ends outwardly from the plane of the respective said body section toward the other said second terminal element, said third arrays being proximate and associated with said first arrays, and said fourth arrays being proximate and associated with said second arrays;

said spring contact arms of said third and fourth arrays being longer than the corresponding spring contact arms of said first and second arrays such that the free ends of the contact arms of said third arrays are disposed substantially coplanar with those of the associated first arrays and located axially outwardly therefrom thereby extending said first blade-receiving receptacle, and the free ends of the contact arms of said fourth arrays are disposed substantially coplanar with those of the associated second arrays and located axially outwardly therefrom thereby extending said second blade-receiving receptacle; whereby

upon mating said connector with first and second blade-like members and outward deflection against spring bias of all said contact arms by said blade members, said first and third spring contact arm free ends engage said first blade member at a plurality of inner and outer locations along each said first and second sides thereof and said second and fourth spring contact arm free ends engage said second blade member at a plurality of inner and outer locations along each said first and second sides thereof, and each said first pair element interconnects one of said first and second sides of said first blade with a corresponding one of said first and second sides of said second blade along a plurality of current paths forming thereacross, and each said second pair element also interconnects one of said first and second sides of said first blade with a corresponding one of said first and second sides of said second blade along a plurality of current paths therealong, all thereby lowering resistance.

4,983,133

ELECTRICAL TERMINAL WITH ANNULAR SECTION

William C. Van Scyoc, 600 Charles St., Shippensburg, Pa. 17257, and James H. Wise, 607 Cambridge Ct., Palmyra, Pa. 17078

Filed May 31, 1989, Ser. No. 359,240

Int. Cl.[5] H01R *4/48*

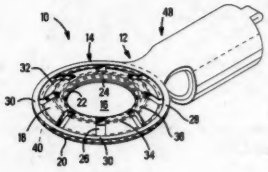
U.S. Cl. 439—860 **15 Claims**

1. An improved electrical terminal suitable for use in connecting a first electrical article to a second electrical article comprising:

first and second connecting portions at opposed ends of a terminal member for electrically engaging first and second electrical articles respectively;

said first connecting portion comprising an annular section having a centrally disposed fastener receiving aperture extending therethrough from a first major surface to an opposed second major surface, said annular section having an inner edge adjacent said fastener receiving aperture and an outer edge extending circumferentially therearound;

said annular section further including a plurality of slots spaced therearound each extending from at least one integral strap section along one of said inner edge and said outer edge, said slots defining therebetween respective spring sections in an annular array, each of said spring sections at least including a respective protrusion extending outwardly from said first major surface, each said respective protrusion having a crest portion, all of said respective crest portions being disposed substantially in a



common plane and defining an array of first contact surfaces comprising a contact interface for electrical engagement with a common conductive surface of said first electrical article upon being fastened thereto by fastening means; and

said second major surface at least including an array of surface portions engagable by a biasing means held thereagainst by said fastening means securing said first connecting portion of said first terminal member to said first electrical article, thereby compressing said spring sections and establishing contact normal force between said first electrical article and said first contact surfaces; whereby

a plurality of electrical paths in parallel are generated between said first electrical article and said second electrical article upon said terminal being connected to said first and second electrical articles and biasedly held therebetween, thereby minimizing the electrical resistance at the contact interface.

4,983,134

MALE CONTACT ELEMENT FOR LOW INSERTION FORCE ELECTRICAL CONNECTOR

Armel Baldyrou, Houilles, France, assignor to Societe Generale Pour l'Industrie Electronique (S.O.C.I.E.), Rosny-Sous-Bois, France

Filed Apr. 21, 1989, Ser. No. 342,230

Claims priority, application France, Apr. 22, 1988, 88 05368

Int. Cl.[5] H01R *13/04*

U.S. Cl. 439—884 **3 Claims**

1. A male contact element for a low-insertion-force electrical connector of the type having an elongated cylindrical pin portion prolonged proximate its extremity by a tapered portion terminating in a nose of constant-radius generatrices, said contact element characterized in that

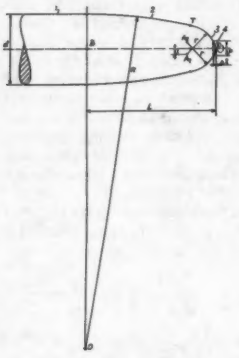
(a) the tapered portion has a length L of $1.80d \leqq L \leqq 1.96d$, d being the nominal diameter of the cylindrical pin portion of the male contact element;

(b) the tapered portion has a first ogival surface of revolution about the longitudinal axis of the contact element with generatrices of constant radius R, such as $6.4d \leqq R \leqq 7.9d$;

(c) a first ogival surface connects tangentially to the cylindrical portion;

(d) a second ogival surface of revolution about the longitudi-

nal axis of the contact element, said second ogival surface constituting said nose of the contact and having generatrices of constant radius r, in which $0.42d \leqq r \leqq 0.52d$; and



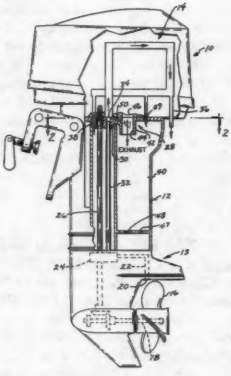
(e) the first and second ogival surfaces being tangentially connected.

4,983,135

APPARATUS AND METHOD FOR COOLING EXHAUST IN AN OUTBOARD MARINE PROPULSION SYSTEM

James C. Boda, Winneconne, and Mark T. Lokken, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 11, 1988, Ser. No. 255,617
Int. Cl.[5] B63H *21/38*
U.S. Cl. 440—88 28 Claims



1. An outboard marine propulsion system, comprising:

a powerhead including a water cooled engine having a cooling water inlet and an exhaust discharge outlet;

a depending driveshaft housing connected at its upper end to said powerhead, said depending driveshaft housing having an exhaust cavity which extends substantially to the powerhead and is in direct communication with said engine exhaust discharge outlet for receiving exhaust therefrom; and

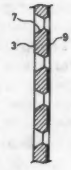
exhaust cooling means for providing cooling water to exhaust flowing through said engine exhaust discharge outlet prior to entrance of the exhaust into said exhaust cavity.

4,983,136

METHOD OF FORMING AN ELECTRON REFLECTING COAT ON CRT SHADOW MASKS

Hiroshi Okuda, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1989, Ser. No. 371,034
Claims priority, application Japan, Jun. 27, 1988, 63-159792
Int. Cl.[5] H01J *29/07*
U.S. Cl. 445—47 8 Claims



1. A method of forming an electron reflecting layer on a perforated shadow mask in a color cathode ray tube having a color electron gun assembly, which method comprises the steps of:

preparing an aqueous suspension containing 20 to 45 percent by weight of powdered bismuth oxide of 0.1 to 1.0 μm in average particle size relative to the total weight of the resultant aqueous suspension and 37.5 to 62.5 percent by weight of water glass relative to the total weight of the powdered bismuth oxide employed, said water glass containing a solid component in a quantity within the range of 25 to 30 percent by weight relative to the total weight of the water glass used;

applying the resultant aqueous suspension onto one of opposite surfaces of the perforated shadow mask which confronts the color electron gun assembly; and

drying a coating of the aqueous suspension on the surface of the perforated shadow mask to complete the electron reflecting layer.

4,983,137

DESIGN AND CONSTRUCTION TOY

Gene B. Carpenter, 420 E. Julian St., Savannah, Ga. 31401

Filed Feb. 10, 1989, Ser. No. 308,484
Int. Cl.[5] A63H *33/04*
U.S. Cl. 446—69 16 Claims

1. A design and construction toy comprising a plurality of relatively rigid elements, each element having:

(1) a first side member and a second side member, with each of said side members having an outer face, an inner face, a top face and a bottom face, and the first side member and second side member being joined at ends thereof to form an apex and to provide a formed equilateral triangle with

an open base and wherein the height from the base to the apex is different for each said element;

(2) a predetermined distance between said outer face and said inner face whereby a derived distance is established between the inner face and the outer face along the juncture of the said joined ends at the said apex;

(3) a lateral distance between said top face and said bottom face which is at least 0.1 and no more than 5.0 times the said predetermined distance; and

(4) a height from the said base to the said apex of the said formed equilateral triangle which is substantially equal to the height of a formed triangle having the greatest height, less an amount substantially equal to the sum of the said derived distances of all of the formed triangles having a greater height;

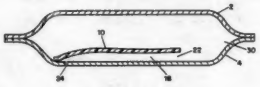
wherein a plurality of the said elements are nestable, outer face to inner face, and a nested plurality of the said elements form an equilateral triangle and nests of nested elements are arrangeable in a nested configuration such that the nested configuration has six equal sides.

4,983,138

INFLATABLE CONTAINER WITH SELF-SEALING VALVE

John McGrath, 17743 April Ct., Castro Valley, Calif. 94546

Filed Nov. 1, 1988, Ser. No. 265,488
Int. Cl.[5] A63H *27/10*; F16K *15/16*
U.S. Cl. 446—224 **9 Claims**



1. A container for holding fluid comprising two container film layers at least one of which has a first opening for the passage of fluid, said layers being joined at the perimeters thereof to form a perimeter seal, a valve film layer attached to an inner surface of the container film layer having said first opening, the valve film layer forming a fluid channel integral with said container film layer through which fluid is guided into the container from said first opening, the fluid channel being located on the container surface so as to perpendicularly cross one or more of a plurality of creases that develop in the inflated container surface, said creases being perpendicular to the perimeter seal, such that as the container attains maximum fluid capacity the fluid channel automatically collapses under the stress resulting from the lateral stretching of the valve film layer and the container layer forming the fluid channel and the stress of the creases acting on the fluid channel, thereby sealing the container so as to prevent the further introduction of fluid therein as well as the leaking out of fluid therefrom.

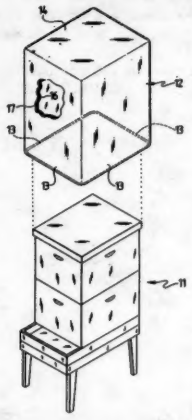
4,983,139

COVER FOR BEEHIVES

Theodore R. Kretschmann, 949 E. Laffayette St., Dadeville, Ala. 36853

Filed Feb. 9, 1989, Ser. No. 308,049
Int. Cl.[5] A01K *47/00*
U.S. Cl. 449—30 **6 Claims**

4. A cover for a beehive comprising a top portion and a plurality of wall portions attached thereto and depending therefrom to surround said beehive in close fitting engagement



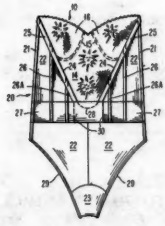
with each of said top and wall portions having an inner flexible reflective layer and an outer flexible energy-absorbent layer.

4,983,140

BACKLESS, STRAPLESS LADIES' BODY BRIEFER

Richard Gimble, New York, N.Y., assignor to Va Bien Ltd., Inc., New York, N.Y.

Filed Feb. 5, 1990, Ser. No. 475,283
Int. Cl.[5] A41C *1/00, 1/02*
U.S. Cl. 450—27 **8 Claims**

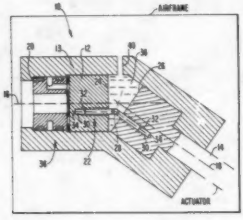


1. In a feminine body briefer that has a front half and a back half connected by two seams and that is strapless and backless with a substantially V-shaped contour forming a cusp in said back half of said body briefer, the improvement comprising a full-length bone sewn at each of said two seams where said back half is connected to said front half of said body briefer, an elastic band extending substantially along line of said back half of said body briefer, the ends of said elastic band being sewn to said two seams and the longitudinal middle of said elastic band being sewn to an edge of said back half at said cusp of said V-shaped contour, and at least one auxiliary bone spaced from each said full-length bone and extending from said V-shaped contour down to and transversing said elastic band, each said auxiliary bone being sewn to said elastic band and said back half.

4,983,141
CONSTANT VELOCITY JOINT FOR HYDRAULIC ACTUATOR IN AN AIRFRAME

Mark S. Stroze, Rockford, and Kenneth C. Spurbeck, Stillman Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 16, 1989, Ser. No. 324,469
Int. Cl.[5] F16D *3/08*
U.S. Cl. 464—7 **17 Claims**



1. A constant velocity joint rotationally connecting rotationally mounted first and second members together each having an axis of rotation comprising:

at least one axial bore within the first member offset from and parallel to the axis of rotation of the first member;

a plurality of channels extending along each axial bore of the first member which are located in a peripheral wall of each axial bore of the first member;

at least one axial bore within the second member offset from and parallel to the axis of rotation of the second member;

a plurality of channels extending along each axial bore of the second member which are located in a peripheral wall of each axial bore of the second member;

at least one pair of rods connected together by a joint having at least one degree of rotational freedom, one of the rods of each pair of connected rods being disposed in an axial bore within the first member and another of the rods of each pair of connected rods being disposed in an axial bore within the second member;

means for connecting the first member to a hydraulic motor;

a casing means for containing at least a portion of the first and second members and for containing hydraulic fluid utilized by the hydraulic motor; and

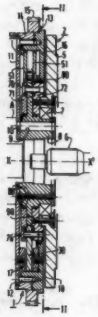
means for supplying leakage hydraulic fluid from the hydraulic motor for lubricating the joints and rods disposed within the axial bores during rotation of the first and second members.

4,983,142
DOUBLE DAMPED FLYWHEEL, ESPECIALLY FOR AUTOMOTIVE VEHICLES

Dominique Despres, Clichy; Jacky Naudin, Ermont, and Jacques Paquin, Villeneuve-la-Garenne, all of France, assignors to Valeo, Paris, France

Filed Jan. 25, 1989, Ser. No. 301,067
Claims priority, application France, Jan. 25, 1988, 88 00804
Int. Cl.[5] F16D *3/14*; F16F *15/12*
U.S. Cl. 464—68 **8 Claims**

2. A double damped flywheel, particularly for an automotive vehicle, of the kind comprising two coaxial masses mounted rotatably with respect to each other against the action of circumferentially acting resilient means, wherein a first one of said masses includes two guide rings having first thrust faces for said resilient means and an axially extendingouter ring portion, while the second one of said masses has at least one damper plate disposed axially between said guide rings and radially within said outer ring portion of the first mass, the damper plate having second thrust faces for said resilient means, the double damped flywheel being characterized by: phasing means for increasing the angular displacement between the two masses having a plurality of thrust pads, each of which is interposed circumferentially between two consecutive ones of said resilient means; and means mounting said phasing means for free rotation with respect to the guide rings and the damper plate, and viscous damping means for damping the movement between the two masses and having two discs

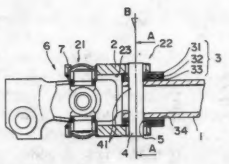


carried by said damper plate which constitutes an axial spacer between these said discs whereby the phasing means are in two parts arranged on either side of said damper plate and internally centered by means of said discs, each of said resilient means being divided into two operative elements; and a plurality of inserts mounting said resilient means pivotally on the thrust pad.

4,983,143
ELASTICALLY COUPLED JOINT

Hiroshi Sekine; Mikio Yamaguchi, both of Takasaki; Kiyoshi Sadakata, Azumamura Kunisada, and Yuichiro Fukunaga, Maebashi, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,490
Int. Cl.[5] B62D *1/16*; F16D *3/76*
U.S. Cl. 464—89 **6 Claims**



1. In a steering mechanism of a vehicle, an elastically coupled joint connecting a shaft and a universal joint, said elastically coupled joint comprising:

a yoke having a first end connected to a spider of the universal joint and tubular second end in which an end of said shaft is concentrically received,

an annular elastic torque transmitting assembly disposed concentrically between and in press-fitted engagement with said second yoke end and said shaft end, and coupling said second yoke end and said shaft end for torque transmission therebetween,

said torque transmitting assembly projecting axially outwardly beyond said second yoke end and including an outer ring press-fitted within said second yoke end and an annular elastic body fixed circumferentially about the inner periphery of said outer ring,

said second yoke and, said torque transmitting assembly, and

said shaft end having respective diametric through holes aligned with one another, and

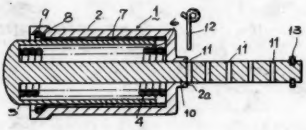
a stopper pin received in said through holes and extending between diametrically opposite wall portions of said second yoke end, with said pin being press-fitted to one of said shaft end and said opposite wall portions of said second yoke end, and received by the other of said shaft end and said opposite wall portions of said second yoke end with a predetermined annular gap about the pin circumference.

4,983,144

BELT OR CHAIN TENSIONER

Juji Ojima, Kanagawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 5, 1989, Ser. No. 446,144
Claims priority, application Japan, Dec. 29, 1988, 63-331953
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—111 **2 Claims**



1. A tensioner for providing a tension to a belt, chain and the like, said tensioner comprising:

a casing,

a tension rod slidably mounted in said casing and biased by a spring force within a hole of said tension rod by a spring having one end engaging a base of said casing and an opposite end engaging a top end of said tension rod,

a shaft of said tension rod extending from said top end of said tension rod toward said base of said casing,

a bearing defined by said base of said casing for slidably supporting said tension rod through said base of said casing,

a portion of said shaft of said tension rod drawn out from said base of said casing in a direction opposite to a direction in which said tension rod is biased, said drawing out portion being supported slidably in said bearing formed in said base of said casing,

a plurality of holes formed in said portion of said shaft of said tension rod drawn out from said base of said casing, and

a stopper pin being located in one of said holes to lock said tension rod in an arbitrary position for maintenance of said tensioner with ease and in safety.

4,983,145

APPARATUS FOR AUTOMATICALLY TENSIONING A DRIVE BELT

Hideo Hirai, Kakogawa; Masakatsu Ando, Kobe; Yasuhiro Hashimoto, Miki; Naoki Fujimoto, Kobe; Norikazu Tanaka, Osaka, and Susumu Yamakawa, Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Japan

Filed Sep. 26, 1989, Ser. No. 412,941
Claims priority, application Japan, Sep. 27, 1988, 63-243090
Int. Cl.[5] F16H *7/10*
U.S. Cl. 474—117 **29 Claims**

1. An apparatus for tensioning a drive belt, said tensioning apparatus comprising:

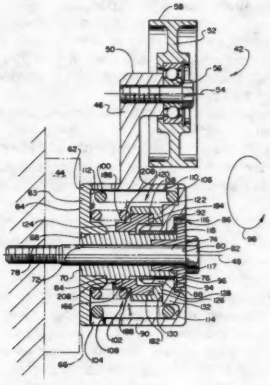
a tensioner arm having an idler pulley for engagement with a surface of a drive belt;

means for mounting the tensioner arm to a support for pivoting movement about a pivot axis in first and second opposite directions; and

means for biasing the tensioner arm in one of said first and second directions,

said mounting means including first and second members with first and second relatively movable cooperating friction generating cam surfaces, said cam surfaces being in direct contact with each other for damping rotation of the tensioner arm,

at least a portion of one of said friction generating surfaces being concave opening towards the tensioner arm pivot axis,



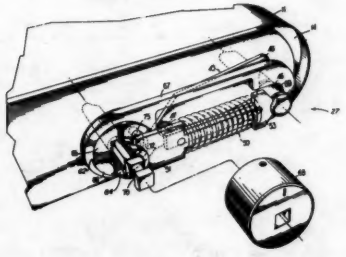
at least one of said friction generating surfaces having at least a portion defined by other than a radius centered on the pivot axis of the tensioner arm to act directly against the other of the friction generating surface, thereby defining means for producing a resistance to rotation of the tensioner arm that increases progressively as the tensioner arm moves in the other of said first and second directions.

4,983,146

BELT TENSIONING AND QUICK RELEASE DEVICE FOR ELECTROPHOTOGRAPHIC SYSTEM

Kirk W. Charles, Atlanta, and Danny L. Slayton, Lilburn, both of Ga., assignors to Colorocs Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 28,973, Mar. 23, 1987, Pat. No. 4,788,572. This application May 17, 1988, Ser. No. 194,927
Int. Cl.[5] G03G *5/00*
U.S. Cl. 474—117 **2 Claims**



1. A device for supporting an endless belt used in an electrophotographic print engine, comprising:

a frame;

an endless belt;

a drive roller for supporting said belt, said drive roller being operatively associated with said frame;

an idler roller for supporting said belt;

an idler shaft for supporting said idler roller, said idler shaft being mounted relative to said frame for travel along a path segment such that if said idler shaft travels in a first direction along said path segment, said belt is placed in progressively greater tension, and if said idler shaft travels along said path segment in a second direction opposite to said first direction, said belt is placed in progressively lesser tension;

a second shaft mounted in operable association with said frame such that said second shaft may rotate about its longitudinal axis relative to said frame;

means for urging said idler roller in said first direction, such that said endless belt is maintained in tension during operation of said print engine;

a tensioning cam pivotably attached to said frame, said tension cam defining a cam surface segment, said segment configured to be in contact with said idler shaft such that said cam allows said idler roller mounted upon said idler shaft to travel in said first direction, but not in said second direction;

a pegged release cam mounted for rotation with said second shaft during nonoperation of said print engine in order to replace said endless belt, said pegged release cam including a peg and also including a cam surface for selectively contacting, pivoting and disengaging said tensioning cam upon rotation of said pegged release cam;

a retracting cam mounted for rotation about said second shaft, said retracting cam including an arcuate slot for receiving said peg, said retracting cam also defining a substantially cylindrical boss having a longitudinal axis substantially parallel but offset relative to said second shaft;

a retracting plate defining a substantially circular aperture configured to rotatably accept said substantially circular boss of said retracting cam, and also defining a second aperture configured to encircle said idler shaft;

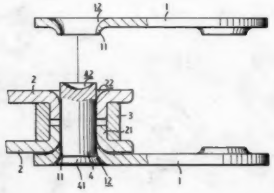
such that as said second shaft is rotated in a first direction, said peg of said pegged release cam disengages said tensioning cam, and thereafter engages said retracting cam such that said reacting cam retracts said retracting plate such that said idler shaft travels in said second direction such that said endless belt is slackened.

4,983,147

COUPLING PORTION OF A CHAIN

Chia L. Wu, No. 734, Chung Sha Rd., Kwei Jen Hsiang, Tainan Hsien, Taiwan

Filed Apr. 4, 1990, Ser. No. 504,574
Int. Cl.[5] F16G *1/24*
U.S. Cl. 474—206 **1 Claim**



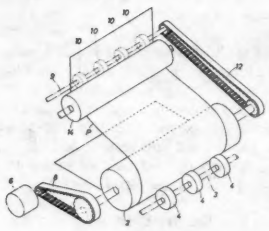
1. A coupling portion of a chain, said chain comprising a plurality pairs of inner sheets and a plurality pairs of outer sheets alternatively coupled together; each said inner sheet having two first rings integrally formed together, a first annular flange being formed on a center of each said first ring and being substantially perpendicular to said inner sheet; each said outer sheet having two second rings integrally formed together, a second annular flange being formed on a center of each said second ring and being substantially perpendicular to said outer sheet, a width of each said second annular flange being gradually decreased toward a free edge thereof; an inner surface of an opposite end to a free edge of each said first annular flange being rounded so as to form a first recess, and an inner surface of an opposite end to said free edge of each said second annular flange being rounded so as to form a second recess; a pair of rollers being rotatably supported between each pair of said inner sheets around said first annular flanges of said inner sheets; each said second annular flange of said outer sheet being received and engaged in a respective first recess; a pin having a head formed on one end and a depression formed in an other end thereof, said pin being inserted through a pair of said first annular flanges and a respective pair of said second annular flanges which are aligned, said head of said pin being engaged and received in one of said second recesses, and said other end of said pin being deformed so as to be enlarged and engaged in a respective second recess; and both ends of said pin being substantially embedded in said outer sheets so that said outer sheets have a flat outer surface without protrusions.

4,983,148

MECHANICAL COMPONENT CONSISTING OF ANTI-STATIC MATERIAL

Asaharu Nakagawa, Yokkaichi, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Dec. 1, 1989, Ser. No. 444,691
Claims priority, application Japan, Dec. 12, 1988, 63-314461
Int. Cl.[5] F16G *1/08*; H01B *1/06*
U.S. Cl. 474—263 **17 Claims**



1. A mechanical component that is resistant to static electricity, comprising a body, said body formed from an elastic synthetic resin, said synthetic resin having carbon fibers formed on a metallic core uniformly dispersed throughout said synthetic resin such that said body has an electrical resistance in the range of 10^3 to 10^{10} ohm.cm.

4,983,149

NONSTEP SPEED CHANGE GEAR

Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 333,813, Apr. 6, 1989, abandoned. This application Oct. 30, 1989, Ser. No. 428,431
Claims priority, application Japan, May 20, 1987, 62-135583
Int. Cl.[5] F16H *47/04*
U.S. Cl. 475—76 **1 Claim**

1. A nonstep speed change gear, comprising:

a differential mechanism having first, second and third input-/output ends, and having a low speed and a high speed mechanical transmission line operation in parallel with one another, wherein said low speed mechanical transmission line operates through said first and second input/output ends, and said high speed mechanical transmission line operates through said first and third input/output ends, and further wherein power from a prime mover is supplied to said first input/output end;

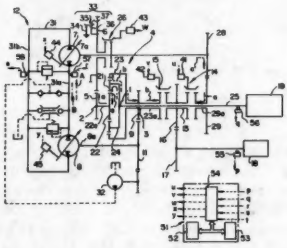
a fluid transmission mechanism having a two-part fluid circuit connecting a pair of fluid pump/motors, each pump-

/motor having an input/output shaft operatively connected to one of said transmission lines, respectively, in order to form a variable speed transmission line;

a low speed clutch means for coupling and uncoupling said low speed mechanical transmission line with an output shaft;

a high speed clutch means for coupling and uncoupling said high speed mechanical transmission line with said output shaft;

clutch control means for controlling the coupling and uncoupling of said low and high speed clutch means, including means for detecting a speed ratio of the output speed of said output shaft to an input speed at said first input/output end, and wherein a predetermined intermediate speed setting ratio represents a condition in which the



difference in rotation speeds between said low speed clutch means and said high speed clutch means is substantially zero, such that when said detected speed ratio is less than said intermediate speed setting ratio, only said low speed clutch means is coupled, when said speed ratio is greater than said intermediate speed setting ratio only said high speed clutch means is coupled, and when said speed ratio is within a predetermined range of said intermediate speed setting ratio, both said low speed clutch means and said high speed clutch means are coupled in an intermediate lock-up mode; and

pump/motor control means for regulating the displacement of each pump/motor such that the differential pressure between each part of said two-part fluid circuit is substantially zero during said intermediate lock-up mode.

4,983,150

DIFFERENTIAL GEAR APPARATUS WITH DIFFERENTIAL LIMITATION MECHANISM

Takao Tashiro, and Osamu Ishikawa, both of Tochigi, Japan, assignors to Viscodrive Japan Ltd., Japan

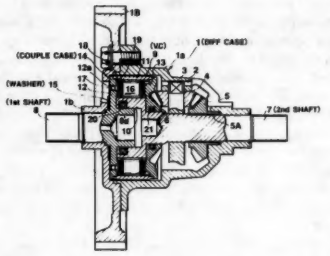
Filed Oct. 12, 1989, Ser. No. 420,752

Claims priority, application Japan, Oct. 28, 1988, 63-270996

Int. Cl.[5] F16H *1/44*

U.S. Cl. 475—85 **3 Claims**

1. A differential gear apparatus provided with a differential limitation mechanism having a differential case for receiving a rotative input power; a pinion gear rotatably supported by the differential case via a pinion shaft; a pair of side gears in mesh with the pinion gear; a coupling case rotatable together with one of the side gears to transmit rotative power to a first output shaft; an inner hub disposed rotatably relative to the coupling case; a working chamber partitioned by the inner hub and the coupling case and filled with a viscous fluid; two sets of resistance plates engaged with the coupling case and the inner hub, respectively; and a second output shaft coupled to the other of the side gear, wherein said coupling case is formed as one piece



with said first output shaft to increase rigidity of said coupling case.

4,983,151

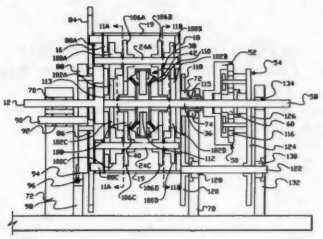
TRANSMISSION RATIO CHANGING APPARATUS AND METHOD

Paul B. Pires, Ben Lomond, Calif., assignor to Epilogics, Inc., Los Gatos, Calif.

Continuation-in-part of Ser. No. 232,472, Aug. 15, 1988, abandoned. This application May 30, 1989, Ser. No. 359,024

Int. Cl.[5] F16H *3/44*

U.S. Cl. 475—170 **48 Claims**



1. An apparatus for modifying an input rotation to produce a modified rotational output, comprising:

(a) means for establishing said input rotation;

(b) first means responsive solely to and synchronized with said input rotation for producing a first intermediate rotation which varies in speed in accordance with a first specific waveform at a particular peak amplitude corresponding to the maximum speed of said intermediate rotation;

(c) second means responsive solely to and synchronized with said input rotation for producing a second intermediate rotation which varies in speed in accordance with a second specific waveform identical to but 90degrees out of phase with said first waveform; and

(d) means for simultaneously coupling said first and second intermediate rotations to an output shaft in a way which causes said shaft to rotate and thereby provide a rotational output, said coupling means being designed to average said intermediate rotations such that said rotational output is an output which corresponds in speed to the average of said first and second sinusoidal waveforms, whereby the speed of said output shaft depends upon the amplitude of said waveforms;

(e) said input rotation and said intermediate rotations being in the same direction and wherein each of said intermediate rotations vary in speed between a minimum speed

equal to said input rotation and a maximum speed exceeding said input rotation;

(f) said first intermediate rotation producing means including

(i) first means for generating first epicyclic motion consisting of an orbital component in the same direction and at the same speed as said input rotation, and a reciprocating component first increasing then decreasing in speed in the same direction as said orbital component during a first half-cycle of said orbital component and thereafter increasing and then decreasing in speed in the opposite direction during the second half-cycle of said orbital component, in accordance with a particular waveform,

(ii) second means for generating second epicyclic motion identical to said first epicyclic motion, except that its reciprocating component is 180° out of phase with the reciprocating component of said first epicyclic motion, and

(iii) means for converting said first and second epicyclic motions to said first intermediate rotation; and

(g) said second intermediate rotation producing means including

(i) third means for generating third epicyclic motion identical to said first and second epicyclic motions except that its reciprocating component is 90° out of phase with the reciprocating components of said first and second epicyclic motion,

(ii) fourth means for generating fourth epicyclic motion identical with said first, second and third epicyclic motions, except that its reciprocating component is 180° out of phase with the reciprocating component of said third epicyclic motion and 90° out of phase with said first and second epicyclic motions; and

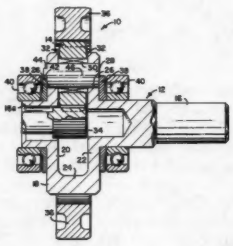
(iii) means for converting said third and fourth epicyclic motions to said intermediate rotation.

4,983,152

PLANET GEAR FRAME ASSEMBLY

Robert R. Kimberlin, Athens; Robert E. Geiger, Sayre; Frank Speck, and Wayne Allis, both of Athens, all of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake N.J.

Filed Sep. 8, 1989, Ser. No. 404,614
Int. Cl.[5] F16H *3/44*
U.S. Cl. 475—331 **1 Claim**



1. A planet gear frame assembly, comprising:

a frame;

at least one planet gear;

at least one pin, upon which each said planet gear is journalled, engaged with said frame;

means for retaining said pin in place relative to said frame comprising a washer engaged with said frame; and

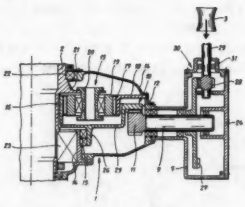
a plurality of axially extending lands, all formed at different distances extending radially from the pin axial centerline, on at least one end of said pin for engaging said washer and thereby preventing rotation of said pin relative to said frame; wherein said washer is engaged with only one of the lands during operation of the assembly.

4,983,153

GEAR UNIT, PARTICULARLY FOR USE IN A HELICOPTER

Waltherus J. T. H. Luijten, Breugel, Netherlands, assignor to DAF Special Products, Geldrop, Netherlands

Continuation of Ser. No. 941,146, Dec. 12, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 294,403
Claims priority, application Netherlands, Dec. 18, 1985, 8503488
Int. Cl.[5] F16H *1/32, 57/02;* B64C *27/12*
U.S. Cl. 475—343 **5 Claims**



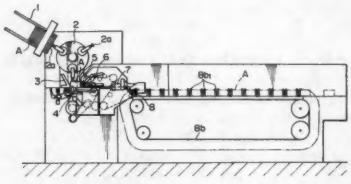
1. A gear unit having a plurality of reduction stages, for use in a helicopter, and intended for a relatively high output torque at an output shaft which carries and drives the main rotors of the helicopter with a relatively low speed of rotation and a total transmission ratio between about 70 and 150, comprising at least one reduction stage with non-parallel shafts, and including a face gear transmission used on the last or next to last reduction stage of the gear unit, said stage with non-parallel shafts comprising a rotor shaft, a gear box mounted around said rotor shaft, a face gear disposed in said gear unit positioned concentrically to said output shaft and cooperating with a cylindrical spur gear on said rotor shaft which transmits power to the output shaft, said cylindrical spur gear being removable from said gear unit through detachable cover means mounted to said gear box and/or by detaching said gear box procedures previously required to replace the cylindrical spur gear.

4,983,154

CARTON ASSEMBLING METHOD AND EQUIPMENT

Toshio Nagahashi, Chiba; Kiyoshi Yamashita, Ibaraki, and Minoru Sato, Chiba, all of Japan, assignors to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,583
Int. Cl.[5] B31B *1/80*
U.S. Cl. 493—315 **14 Claims**



1. A carton assembling method comprising the steps of separately removing flatwise folded cartons as individual cartons having a folded edge from a magazine; unfolding each of the individual cartons to form an unfolded carton while transferring the individual cartons downward along a rotative path, wherein the unfolding of each of the individual cartons comprises bringing the folded edge of the carton being transferred downward along the rotative path into sliding pressure contact with a fixed, inclined guide of a series of guides which gradu-

ally approach a path of movement of the folded edge of the carton, which as a result of the downward rotative path and the sliding pressure contact with the inclined guides, gradually causes the unfolding of the carton; holding a pair of opposed folding-side corner portions on each opening side of the unfolded carton squarely between a pair of stoppers; moving the carton in a direction in which both pair of folding-side corner portions approach each other to reverse-fold the carton; approximately orthogonally expanding and enfolding flaps of the reverse-folded carton; and then squarely unfolding the carton;

4,983,155

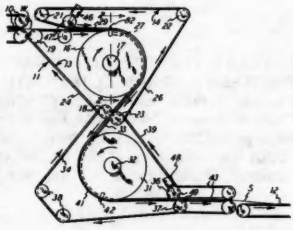
PAPER WEB CUTTER

Walter J. Stobb, Pittstown, N.J., assignor to Stobb Inc., Clinton, N.J.

Continuation of Ser. No. 182,454, Apr. 18, 1988, abandoned. This application May 7, 1990, Ser. No. 520,839

Int. Cl.[5] B26D *1/56*; B65H *37/00*

U.S. Cl. 493—369 **23 Claims**



1. A paper web cutter for cutting across the width of a moving web of paper in locations along its length and transverse to the longitudinal direction of movement of the web of paper, comprising a continuously cycling conveyor having a length thereof arranged to be guided to present two portions opposed to each other and movable in unison and including two parallel lengths extending in repetitious cycles along said length of said conveyor and with each said parallel length having a surface facing the web of paper and extending along said parallel length to have said surfaces in simultaneous contact with the respective opposite face of the web of paper for movably supporting the web of paper therebetween and with said portions also including lengths movable toward and away from each other in the repetitious cycles, one of said portions including a rotatable cylinder for a curved path of conveyor movement, and the other of said portions including a belt trained onto said cylinder in said curved path which presents at least a portion of said parallel lengths, and a paper cutter mounted on one of said portions and extending therefrom toward the other of said portions and terminating in a cutting edge extending parallel to the plane of the web of paper for cutting the web of paper at a location within said length of said surfaces and when said portions have moved toward each other into parallelism and said surfaces are simultaneously pressing on the opposite faces of the web of paper.

4,983,156

CENTRIFUGAL SEPARATOR

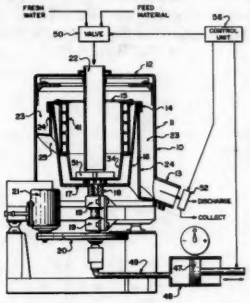
Benjamin Knelson, 20313-8th Avenue, R.R. #11, Langley, British Columbia, Canada (V3A 6Y3)

Filed Jul. 3, 1989, Ser. No. 374,700

Int. Cl.[5] B04B *11/00*

U.S. Cl. 494—28 **31 Claims**

1. Apparatus for centrifugally separating intermixed materials of different specific gravities comprising a centrifuge member, means for rotating the centrifuge member about an axis, means defining a surface on the centrifuge member for rotation therewith and surrounding the axis so as to face inwardly toward the axis, means for supplying the materials in fluid form to the surface so that the materials can move axially along the surface while rotating with the surface about the axis toward a discharge end of the surface, the surface and the centrifuge member including means shaped such that a layer of the materials collects on the surface, which layer retains preferentially materials of higher specific gravity, means movable in a direction radial to the axis in a first direction to increase the radial



thickness of the layer to collect the materials in the layer and a second opposed direction to discharge the collected materials from the centrifuge member and control means arranged to cause movement of said movable means in said first direction gradually over a period of time to gradually increase the radial thickness of the layer up to a maximum thickness and subsequently to cause movement in the second direction to a position of the movable means to cause discharge of the layer.

4,983,157

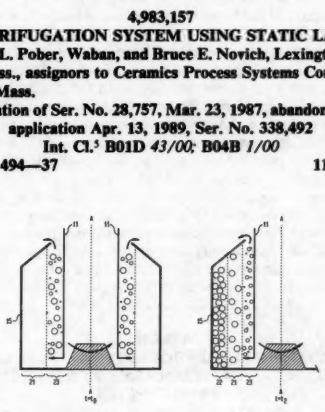
CENTRIFUGATION SYSTEM USING STATIC LAYER

Richard L. Pober, Waban, and Bruce E. Novich, Lexington, both of Mass., assignors to Ceramics Process Systems Corp., Milford, Mass.

Continuation of Ser. No. 28,757, Mar. 23, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 338,492

Int. Cl.[5] B01D *43/00*; B04B *1/00*

U.S. Cl. 494—37 **11 Claims**



1. An improved method of centrifugally separating and recovering a colloidal phase from a fluid suspension, of the type comprising the steps of adding the fluid suspension into a rotating centrifuge bowl whereby desired colloids are separated from the suspension, wherein the improvement comprises:

filling a rotating centrifuge bowl with a fluid medium distinct from the suspension, so that a static layer of fluid medium forms adjacent the bowl wall and rotating therewith; and

then introducing the suspension into the rotating centrifuge bowl concentrically inside of the static layer, and wherein the colloids are insoluble, such that a size range of colloids

is separated from a broader size range of colloids in the fluid suspension into the static layer.

4,983,158

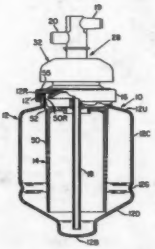
PLASMAPHERESIS CENTRIFUGE BOWL

Thomas D. Headley, Wellesley, Mass., assignor to Haemonetics Corporation, Braintree, Mass.

Continuation of Ser. No. 232,544, Aug. 15, 1988, abandoned, which is a continuation of Ser. No. 888,764, Jul. 22, 1986, abandoned. This application Nov. 15, 1989, Ser. No. 436,963

Int. Cl.[5] B04B *7/02*

U.S. Cl. 494—41 21 Claims



1. A disposable centrifuge rotor comprising:

(a) an integral seamless, plastic, optically transparent, unitary bowl body having an inner wall and an outer wall and rotatable about an axis and having a main body portion extending concentric to said axis, with upper and lower body portions extending radially inwardly toward said axis and a single aperture therein through said upper body portion which aperture is smaller than the inner wall diameter of the bowl body transverse said axis at said main body portion;

(b) a rotary seal assembly affixed to said bowl body and covering said aperture and comprising a non-rotatable seal ring and a rotatable seal ring, with the rotatable seal ring affixed to said bowl body at the aperture and fixed inlet and outlet ports affixed to said non-rotatable seal ring and in fluid communication with the interior of the bowl body, the inlet port extending along the bowl axis to the lower body portion of the bowl body; and

(c) a separate rigid core member directly abutting said bowl body and detached from said rotary seal assembly having an outer diameter smaller than said aperture and rotatable with said bowl body and comprising a cylindrical core extending concentric to the bowl body axis along a substantial length of the inlet port.

4,983,159

INDUCTIVE HEATING PROCESS FOR USE IN CAUSING NECROSIS OF NEOPLASMS AT SELECTIVE FREQUENCIES

Robert W. Rand, 521 N. Bristol St., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 715,254, Mar. 25, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,190

Int. Cl.[5] A61N *2/00*

U.S. Cl. 600—9 8 Claims

1. A process of effecting necrosis of neoplasms in warm blooded animals as a result of hyperthermia of the neoplasm which comprises:

introducing particles into said warm blooded animal in the proximity of said neoplasm so as to associate said particles with said neoplasm, said particles capable of exhibiting hysteresis heating, said particles of a size of at least two microns in diameter so as to be incapable of being intracellularly absorbed, said particles further having a curie point in the range of 42° C. to 90° C.;

subjecting the area of said warm blooded animal wherein said neoplasm having said particles associated therewith is located to an alternating magnetic field, said field of a frequency greater than 25 KHz and less than 50 KHz wherein said field is capable of causing hysteresis heating of said particles, and is insufficient to cause eddy current and dielectric heating of the surrounding tissue of said warm blooded animal and further said field is of a frequency greater than that capable of causing a neuromuscular response to said field in said warm blooded animal;

maintaining said neoplasm within said field for a time sufficient to heat said particles and said neoplasm, with which said particles are associated, to a temperature of at least 42° C.

4,983,160

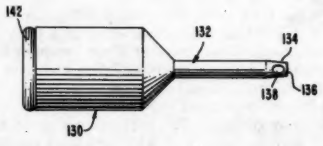
RIGID TRANSPARENT FLUID CONDUIT FOR OPHTHALMIC SURGICAL IRRIGATION

Dennis L. Steppe, Anaheim, and Stephen W. Haines, Tustin, both of Calif., assignors to Nestle S.A., Fort Worth, Tex.

Continuation-in-part of Ser. No. 119,268, Nov. 9, 1987, Pat. No. 4,787,889, which is a continuation of Ser. No. 780,813, Sep. 27, 1985, abandoned. This application Nov. 28, 1988, Ser. No. 276,550

Int. Cl.[5] A61B *17/20*

U.S. Cl. 604—22 43 Claims



1. For use with an ophthalmological surgical instrument providing irrigating and aspirating functions, having an elongated handpiece containing an irrigation fluid supply conduit, and having an elongated tool connected to the handpiece, an irrigation fluid conduit comprising:

a hollow body portion including body walls surrounding an axis, a first end open for fluid transmissive communication with the irrigation fluid supply conduit, a second end having an axial opening therein, and an engaging means for engaging said handpiece;

a tubular sleeve portion in fluid transmissive communication with said axial opening in said second end and coaxially extending therefrom, configured to surround the too, and having a thin sleeve wall whose thickness is not greater than 0.006 inches;

said hollow body portion and said tubular sleeve portion being homogeneously molded from a polyolefin synthetic resin which is transparent when immersed in the aqueous humor of the eye, so that, when said engaging means engages the handpiece, the tool, when in the eye, and the adjacent tissues can be visualized by the surgeon through said sleeve portion, and which has a diametric rigidity great enough to prevent collapse of said sleeve when it is inserted into an ocular incision;

an elastomeric sealing ring overmolding said first end opening of said body section; and,

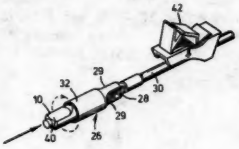
said tubular portion has a sleeve length-to-wall thickness of more than two.

4,983,161

METHOD FOR USING A CONNECTOR CAP AND COVER THEREFOR

Joseph E. Dadson, 7 Harrow Smith Place, Richmond Hill, Ontario, Canada (L4E 2E1), and Mahesh Agarwal, 7 Grant's Place, Markham, Ontario, Canada (L3S 2W2)

Filed Jul. 14, 1989, Ser. No. 380,037
Claims priority, application Canada, Feb. 24, 1989, 592017
Int. Cl.[5] A61M 1/00
U.S. Cl. 604—28 2 Claims



1. In the process of peritoneal dialysis wherein a patient catheter is connected to dialysate tubing by a first connector communicating with the catheter and a second connector communicating with the dialysate tubing, one of said connectors defining a sleeve with an external thread and a cylindrical inner bore through which dialysate can flow, the other of said connectors defining an internal thread adapted to engage said external thread and a cylindrical central probe adapted to snugly enter said inner bore when the threads are in engagement, the probe having an internal passage through which dialysate can flow,

a method of aseptically disconnecting said connectors to free the patient temporarily from the dialysis apparatus, comprising the steps:

(a) providing a cap and a cover therefore, one of said cap and cover defining a cylindrical portion having an internal thread capable of engaging said external thread, the other of said cap and cover defining an external thread capable of engaging said first-mentioned internal thread, said other of said cap and cover defining a blind, internal cylindrical bore coaxial with the axis of said last-mentioned external thread, said last-mentioned bore containing liquid disinfectant, said one of said cap and cover defining a cylindrical central probe coaxial with said internal thread and having a diameter such that the probe can snugly enter the said internal cylindrical bore of said other of the cap and cover whenever said last-mentioned internal thread is in engagement with said last-mentioned external thread, the probe having a leading end, a first chamber within the probe containing liquid disinfectant, the chamber opening only through the leading end of the probe, and a second chamber of annular configuration lying outside of the probe and inside of the cylindrical portion of said one of said cap and cover, the second chamber containing liquid disinfectant,

(b) in any order, disconnecting said connectors from each other, and disconnecting said cap from said cover,

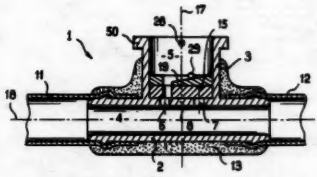
(c) in any order, connecting said one of said connectors to said one of said cap and cover, and connecting said other of said connectors to said other of said cap and cover.

4,983,162

IMPLANTABLE DEVICE FOR ACCESS TO THE BLOOD CIRCULATORY SYSTEM

Joël Metais, Monts-sur-Guesnes, and Gérard Lehmann, Avanton, both of France, assignors to LG Medical, Chasseneuil, France

Filed Nov. 28, 1988, Ser. No. 276,604
Claims priority, application France, Nov. 23, 1987, 87 16195
Int. Cl.[5] A61M 39/00
U.S. Cl. 604—43 6 Claims



1. An implantable device for access to the blood circulatory system, having a tee piece comprising:

a bar or branch outlet, the ends of which are connected to veins, arteries or vascular prostheses;

a shaft having an end for forming an access well which can be connected to an external exchange system;

wherein the connection/disconnection of said device with respect to said external exchange system is achieved by means of a rotary plug mounted in said well, said rotary plug having two orifices which, depending on the position of rotation of said rotary plug, are in communication with or not in communication with the internal volume of the branch of the tee piece and which, at the other end can be connected to an inlet and to an outlet of said external system;

wherein said rotary plug is in the shape of a substantially cylindrical, circular disk whose outer diameter corresponds substantially to the inside diameter of said well, said rotary plug further including:

means cooperating with complementary means of said well in order to ensure, at least in the disconnection position, that said disk bears with pressure on the bottom of said well and the closure of said well is leak-proof;

said complementary means having ramps formed on said plug cooperating with spurs formed on the inner wall of said well.

4,983,163

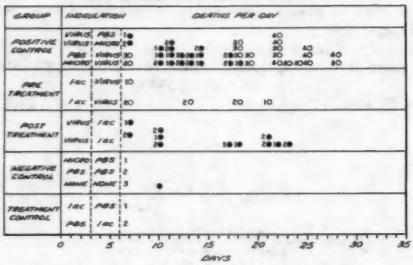
METHOD, COMPOSITIONS AND ARTICLES FOR PREVENTION AND TREATMENT OF HERPES SIMPLEX VIRUS INFECTIONS

Luther Winans, Jr., and Terry L. Foster, both of Abilene, Tex., assignors to Science Research Center, Inc., Abilene, Tex.

Continuation-in-part of Ser. No. 309,936, Oct. 9, 1981, abandoned. This application Mar. 13, 1984, Ser. No. 589,158
Int. Cl.[5] A61M 31/00
U.S. Cl. 604—49 4 Claims

1. A method of alleviating the suffering of a mammal suffering from the active phase of a herpes simplex virus infection, which comprises; applying topically to the infected areas of the

mammal, an effective amount for alleviating suffering of a viable bacterial culture selected from the group consisting of



Lactobacillus acidophilus, Lactobacillus bulgaricus and mixtures thereof.

4,983,164

AUTOMATIC TWO-CHAMBER INJECTOR

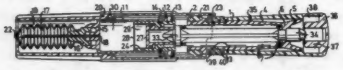
Karl-Axel Hook, Eskilstuna; Nils B. Nilson, Mjolby, and Kjell I. Wellenstam, Gothenburg, all of Sweden, assignors to Astra Meditec AB, Molndal, Sweden

Filed Apr. 12, 1988, Ser. No. 180,455

Claims priority, application Sweden, Apr. 14, 1987, 8701548

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—87 **30 Claims**



17. An automatic two-chamber injector according to claim 16, wherein said powder chamber is disposed in the second end of the barrel; wherein said guide means engage at least one guide member on said barrel, which guide member in turn selectively engages the engagement means of said powder chamber, for moving said barrel and powder chamber toward said plunger, and wherein said guide means, at the said one rotational position of said sleeve, permits the guide member to move out of engagement with the powder chamber and permits said barrel to move forward in said housing and said powder chamber to move forward in said barrel.

4,983,165

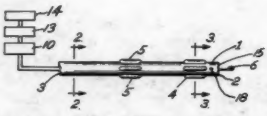
GUIDANCE SYSTEM FOR VASCULAR CATHETER OR THE LIKE

David A. Loiterman, 1806 Midwest Club, Oak Brook, Ill. 60521

Filed Jan. 23, 1990, Ser. No. 469,159

Int. Cl.[5] A61M *25/10*

U.S. Cl. 604—95 **18 Claims**



1. A steerable catheter for introduction into the vascular system of an animal comprising: a tubular member with a proximal and distal end and an inner and outer surface, the outer surface provided with an inflatable steering means, the inner surface defining a passage, the passage provided with a guide wire; and a control means operably linked to the inflatable steering means for selectively inflating same, said control means inflating said inflatable steering means to align said tubular member toward a selected branch of the vascular system, said guide wire being directed through the passage into said selected branch of said vascular system and said tubular member being advanced over the guide wire into said selected branch of the vascular system.

4,983,166

BALLOON CATHETER & METHOD OF USE OF THE SAME

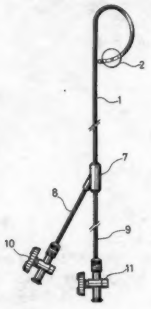
Yoshiharu Yamawaki, 68-banchi, 7-chome, Ozakikita-machi, Kakamigahara-shi, Gifu, Japan

Continuation of Ser. No. 229,677, Aug. 8, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 511,917

Claims priority, application Japan, Dec. 28, 1987, 62-334175

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **4 Claims**



1. A balloon catheter for injecting a drug to an affected part through an artery, comprising:

a catheter body having a circulatory curved tip end portion, whereby said tip end portion can be inserted from a thicker artery into a thinner artery diverging from said thicker artery at an acute angle;

a main passage provided in said catheter body for transporting and ejecting said drug, said main passage having an opening formed on a peripheral surface of said curved tip end portion and a curved portion smoothly curved toward said opening whereby a drug ejecting member and a thinner catheter are allowed to go through said main passage;

a balloon provided around the periphery in said curved tip end portion between said tip end and said main passage, for inflating to block a bloodstream at a desired site inside said thinner artery; and

an auxiliary passage provided in said catheter body for injecting fluid into said balloon for inflating said balloon.

4,983,167

BALLOON CATHETERS

Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740

Filed Nov. 23, 1988, Ser. No. 276,375

Int. Cl.[5] A61M *29/02*

U.S. Cl. 606—194 **6 Claims**

1. A catheter for seducing body lumens, comprising:

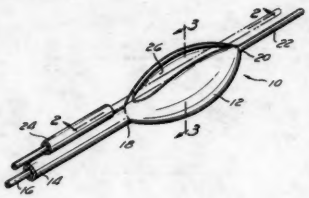
an axially elongate catheter shaft, constructed and arranged for insertion into a distal body lumen, said catheter shaft having an inflation conduit extending axially therethrough;

a dilatation balloon, secured to said catheter shaft, said dilatation balloon in fluid communication with said inflation conduit and outwardly radially expandable to a preselected configuration in response to inflation thereof; and

a movable wire, disposed adjacent said catheter shaft and

movably secured thereto, said movable wire adapted for advancement across a stenotic region within said body lumen, after said lumen has been dilated by said dilatation balloon so as to provide distal access to the body lumen in the event of occlusion thereof;

said dilatation balloon including a groove for receiving and guiding said movable wire past said stenotic region.

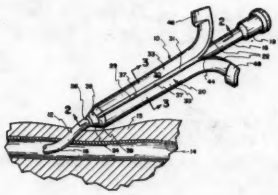


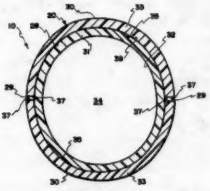
4,983,168

MEDICAL LAYERED PEEL AWAY SHEATH AND METHODS

Harvey R. Moorehead, Salt Lake City, Utah, assignor to Catheter Technology Corporation, Salt Lake City, Utah

Filed Jan. 5, 1989, Ser. No. 295,076
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—161 **11 Claims**





1. A peel away hollow sheath for temporarily creating a passageway into a desired body site of a medical patient for placement of one end of an indwelling device at the body site through the sheath, the sheath comprising:

a laterally continuous conduit having an interior surface forming a hollow borehole therethrough and an exterior surface;

at least one exterior layer segment securely attached about a substantial portion of the exterior surface of the laterally continuous conduit such that the integral strength of the laterally continuous conduit is not weakened by the at least one exterior layer segment and such that at least one longitudinal axially-directed slot is formed where said at least one exterior layer segment is unattached to the exterior surface of the laterally continuous conduit; and

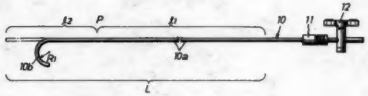
opposed first and second grasping means adjacent a proximal end of the at least one exterior layer segment whereby when the grasping means are manually pulled apart the laterally continuous conduit tears longitudinally adjacent the axially directed slot formed where the at least one exterior layer segment is unattached to the exterior surface of the laterally continuous conduit.

4,983,169

CATHETER FOR ANGIOGRAPHY

Yuichi Furukawa, 112, 2-Chome, Kamihama-Cho, Tsu-Shi Mie-Ken, Japan

Filed Mar. 2, 1989, Ser. No. 318,025
Claims priority, application Japan, Mar. 4, 1988, 63-52417
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 **3 Claims**



1. A remotely controlled angiography catheter device, comprising:

a catheter having a main portion and a front end portion, wherein the main portion is made softer with higher flexibility than that of the front end portion, and wherein the length of the front end portion is shorter than the length of the main position; and

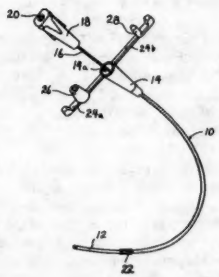
guide wire having a uniform diameter along the length thereof, and wherein the guide wire is inserted into the catheter for guiding the catheter when the catheter is advanced into a blood vessel.

4,983,170

NASOGASTRIC DEVICE

Robert W. Etheredge, III., Natick, and John C. Charkoudian, Newton, both of Mass., assignors to The Kendall Company, Lexington, Mass.

Filed Mar. 25, 1988, Ser. No. 173,486
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—270 **20 Claims**



1. A nasogastric intubation device including a flexible hollow tubing adapted for insertion through the nose, said device having a leading end portion adapted for positioning in the stomach and a trailing end to remain outside the body and through which stomach fluids may be withdrawn or into which fluid may be fed, at least said leading end portion containing a lubricious precursor composition consisting essen-

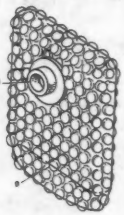
tially of a substantially homogeneous mixture of from about 20 to about 60 percent by weight based upon the total weight of said composition of an unsaturated higher fatty acid having at least sixteen carbon atoms and a polymer compatible therewith, said precursor upon contact with an aqueous alkaline medium forming the lubricious salt of said higher fatty acid whereby to lubricate the surface of said portion containing said precursor composition.

4,983,171

COMFORTABLE OSTOMY POUCH

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co. - Conn., Duncan, S.C.

Filed Jul. 14, 1989, Ser. No. 379,856
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—332 6 Claims



1. An ostomy pouch having a high degree of comfort comprising a polymeric plastic multi-ply air cushion laminate containing:

(a) a polymeric plastic forming web ply of air cushion bubbles including a barrier layer, said air cushion bubbles defining the bag outside,

(b) a polymeric plastic non-forming web ply including a barrier layer, said non-forming web laminated on one surface thereof to the forming web, and

(c) an ostomy fitting sealed to the laminate for attachment to a patient,

(d) such that the air cushion bubbles minimize contact with the patient's skin and prevent moisture build-up and provide free ventilation.

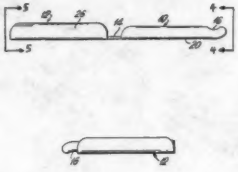
4,983,172

CLIP FOR DRAINABLE OSTOMY POUCH

Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Kingsdown Medical Consultants, Great Britain

Continuation of Ser. No. 898,871, Aug. 20, 1986, abandoned, which is a continuation of Ser. No. 268,037, May 28, 1981, abandoned. This application Nov. 16, 1989, Ser. No. 438,959
Claims priority, application United Kingdom, May 29, 1980, 8017515; Oct. 20, 1980, 8033777
Int. Cl.[5] A61M *31/00;* A61F *5/445;* B65D *77/10*
U.S. Cl. 604—332 6 Claims

1. A clip of synthetic plastics material having two elongated limbs joined by an integral hinge, a first limb of a rounded triangular cross-section having when the clip is in its closed position a bottom surface and a top surface wherein said first limb increases in width continuously from said bottom surface to said top surface, said first limb being of substantially constant width along its length at any given height, the other limb being of channel form having a base, upstanding walls, and an open slot at the top, said channel limb being V-shaped with a rounded bottom whose radius is slightly greater than the radius of said first limb bottom surface, the top parts of said upstanding walls near the end of said channel limb opposite said hinge are shaped to extend towards each other and provide overhanging catch portions that extend along at least a portion of the length of said channel, said first limb being longer than said limb of channel form, said hinge being attached to each limb at or near the bottom surface thereof, and the relative dimensions being such that when closed the majority of the length of said first limb is received in the channel of said other limb and



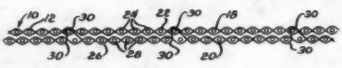
retained therein by said catch portions with a portion of said first limb extending beyond said channel at the end opposite said hinge.

4,983,173

SURGICAL SPONGE

Donald Patience, Cary, and Felipe S. Li, Lake Zurich, both of Ill., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 472,454, Mar. 7, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,545
Int. Cl.[5] A61F *13/54*
U.S. Cl. 604—384 4 Claims



1. A surgical sponge, comprising:

a sheet of absorbent material comprising only two layers of an open mesh gauze fabric having generally parallel woven spaced warp and filling yarns, with a first layer in the sheet comprising totally hydrophobic yarns and defining a first outer surface of the sheet, with a second layer of the sheet comprising substantially hydrophilic yarns and defining a second opposed outer surface of the sheet, with said sheet being folded into a multiple ply configuration, and with the first layer of hydrophobic yarns solely facing outwardly from the folded sheet, wherein the sheet has one or more spaced generally parallel tie-in yarns interwoven between the layers in at least one direction of the sheet.

4,983,174

REFASTENABLE ADHESIVE TAPE CLOSURE

Allen L. Noreen, Lake Elmo, Minn.; Dean R. Crissinger, Prescott, Wis.; William L. Melbye; Eric G. Rodgers, both of St. Paul, Minn.; Alan J. Sipinen, Maplewood, Minn., and Leigh F. Wood, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minnesota

Filed Apr. 4, 1988, Ser. No. 177,494
Int. Cl.[5] A61F *13/15;* B32B *3/00*
U.S. Cl. 604—389 28 Claims

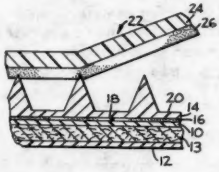
1. A refastenable closure comprising a pressure-sensitive adhesive-bearing fastening tab and a target portion having a working face for contact with said adhesive-bearing fastening tab, wherein

said working face of said target strip is formed with peaks and valleys,

the height of said peaks above said valleys being substantially uniform and from about 40 to 300 μm,

the spacing between adjacent peaks being from about 50 to 500 μm,

the back face of said target portion is substantially flat, and



the thickness of the adhesive layer of said tab is no more than about 90% of the height of said peaks above said valleys.

4,983,175

DEPILATORY DEVICE

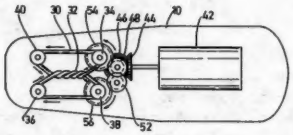
Yair Daar, Moshav Galia, and Shimon Yahav, 90 Tchernokovsky Street, Rehovot, both of Israel

Filed Sep. 11, 1989, Ser. No. 405,888

Claims priority, application Israel, Sep. 22, 1988, 87833

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—133 **36 Claims**



18. An electrically powered depilatory device comprising:

a hand held portable housing;

a hair engagement and removal assembly including elongate elements in mutually twisted engagement; and

motor means for driving the elongate elements in motion, whereby hair is engaged between the elongate elements and thus removed,

and wherein the arrangement of the engagement and removal assembly is such that the location of the twisted engagement remains generally static relative to the housing.

4,983,176

DEFORMABLE PLASTIC SURGICAL CLIP

Robert Cushman, Cedar Crest; Wolff M. Kirsch, and Yong H. Zhu, both of Albuquerque, all of N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Mar. 6, 1989, Ser. No. 319,297

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—151 **2 Claims**

1. A method of joining tissue edges with a surgical clip having holding ears thereon, comprising steps of

holding said clip by its ears with a tool,

supporting said clip against rearward movement at a point midway between its ears, while

pulling back on said ears to open said clip,

placing said arms over said tissue edges, and then

releasing said ears from said tool, thereby allowing the clip to spring back in position over said tissues.

4,983,177

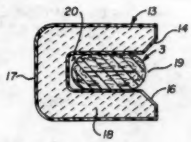
METHOD AND APPARATUS FOR REVERSIBLY OCCLUDING A BIOLOGICAL TUBE

Gerald L. Wolf, 100 Denniston St. #77, Pittsburgh, Pa. 15206-4043

Filed Jan. 3, 1990, Ser. No. 460,314

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—157 **19 Claims**



1. A method of reversible occlusion of a biological tube of a subject comprising:

providing occluding means composed at least in part of a material fragmentable by shock waves,

engaging said occluding means into contact with said biological tube at a predetermined location along said tube to interrupt passage of material through said tube.

4,983,178

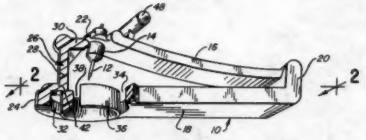
LANCING DEVICE

William J. Schnell, Libertyville, Ill., assignor to Invictus, Inc., Chicago, Ill.

Filed Nov. 14, 1988, Ser. No. 270,077

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—181 **16 Claims**



1. An integrated lancing device which comprises:

a generally U-shaped spring member defining a pair of arms having free ends; a lance blade carried in transverse position on one of said arms adjacent said free end, the free end of said one arm defining a trigger projection positioned substantially along the axis of said one arm; the

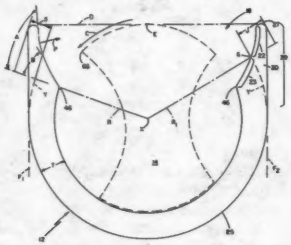
other of said pair of arms carrying a trigger member as an integral part thereof, said trigger member extending toward said trigger projection, whereby said arms may be flexed outwardly into a cocked position and held there by engagement of the trigger projection by the trigger member, and the trigger member may be manipulated to cause the arms to suddenly flex together to cause the lance blade to strike a positioned body part of a patient, the other of said pair of arms having a free end and defining, adjacent its free end, an outer platform defining a first aperture and an inner platform defining a second aperture, said inner platform being positioned within the first aperture and being connected to said outer platform through a flexible connection member, said trigger member being carried in a position to move with the flexing of the inner platform at said connection member, said lance blade being positioned to pass through the second aperture as the arms flex together, whereby pressing with the body part of the inner platform of the lancing device in cocked position causes the trigger member to release the trigger projection and the lance blade to strike said body part.

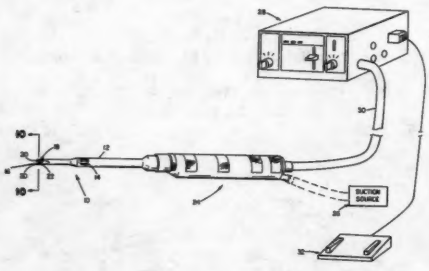
4,983,179

ARTHROSCOPIC SURGICAL INSTRUMENT

Douglas D. Sjostrom, Wakefield, Mass., assignor to Smith & Nephew Dyonics Inc., Andover, Mass.

Continuation of Ser. No. 948,315, Dec. 30, 1986, Pat. No. 4,834,729. This application Mar. 8, 1989, Ser. No. 320,628
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—180 **15 Claims**





1. In an arthroscopic surgical instrument comprising an outer stationary member sized to enter a joint through a puncture opening, said outer stationary member comprising a body and defining, in a wall of said body, at least one distal aperture, the wall of the outer member at the aperture defining a first, fixed blade surface terminating in a cutting edge,

an internal movable member disposed within the outer member, adapted to be power driven and having a second cutting edge arranged to move toward and closely past said fixed cutting edge in rapid, repetitive fashion to sever tissue,

the improvement wherein a table extension at said aperture projects from the body of said outer stationary member in retrograde manner with an outward component and a component that defines a surface opposed to the direction of movement of said second cutting edge and constructed to engage tissue against which the operator urges the instrument, in a manner to improve the repetitive cutting action.

4,983,180

COATED SUTURES EXHIBITING IMPROVED KNOT SECURITY

Tatsuya Kawai; Takashi Matsuda, and Michiaki Yoshimoto, all of Hiroshima, Japan, assignors to Japan Medical Supply Co., Ltd., Hiroshima, Japan

Filed Mar. 1, 1989, Ser. No. 317,689
Claims priority, application Japan, Mar. 4, 1988, 65-50640
Int. Cl.[5] A61R *17/00*
U.S. Cl. 606—230 **4 Claims**

1. A suture exhibiting an improved tie-down performance and maintaining good knot security when tied, comprising braided synthetic fibrous sutures coated with a coating composition for lubricating the suture, the fibers of the suture having crimps for providing texture to the suture.

4,983,181

COLLAGEN HYDROGEL FOR PROMOTING EPITHELIAL CELL GROWTH AND ARTIFICIAL LENS USING THE SAME

Linda Civerchia, Ft. Lauderdale, Fla., assignor to CBS Lens,, Santa Maria, Calif.

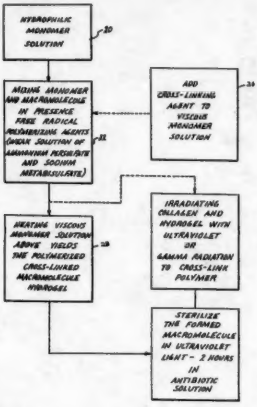
Continuation of Ser. No. 920,031, Oct. 16, 1986, abandoned. This application Sep. 1, 1989, Ser. No. 402,986
Int. Cl.[5] A61F *2/14*
U.S. Cl. 623—5 **20 Claims**

1. A collagen-hydrogel for promoting epithelial cell growth comprising

a hydrogen polymer formed by the free radical polymerization of a hydrophilic monomer solution gelled and crosslinked to form a three dimensional polymeric meshwork for anchoring collagen; and

a stock solution of collagen comprising a constituent of a ground substance of tissue added to and interdisposed within said polymeric meshwork forming a collagen-hydrogel for promoting epithelial cell growth and attachment of such cells to the surface of the hydrogel polymer, said collagen-hydrogel, when attached to Bowman's

membrane of the cornea of an eye, being capable of supporting and promoting epithelial cells growth enabling the


HYDROPHILIC MONOMER SOLUTION
20
MIXING MONOMER AND MACROMOLECULE IN PRESENCE FREE RADICAL POLYMERIZING AGENTS (AQUA SOLUTION OF AMMONIUM PERSULFATE AND SODIUM METABISULFITE)
22
ADD CROSS-LINKING AGENT TO VISCOUS MONOMER SOLUTION
24
HEATING VISCOUS MONOMER SOLUTION ABOVE YIELDS THE POLYMERIZED CROSS-LINKED MACROMOLECULE HYDROGEL
26
IRRADIATING COLLAGEN AND HYDROGEL WITH ULTRAVIOLET OR GAMMA RADIATION TO CROSS-LINK POLYMER
STERILIZE THE FORMED MACROMOLECULE IN ULTRAVIOLET LIGHT - 2 HOURS IN ANTIBIOTIC SOLUTION

corneal epithelium to adhere to and cover said collagen-hydrogel.

4,983,182

CERAMIC IMPLANT AND PROCESS FOR ITS PRODUCTION

Naoto Kijima, Yokohama, and Yasuo Oguri, Tokyo, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,640

Claims priority, application Japan, Feb. 8, 1988, 63-27027; Feb. 8, 1988, 63-27029; Feb. 8, 1988, 63-27031

Int. Cl.[5] A61F *2/28, 2/30*

U.S. Cl. 623—16 **7 Claims**

1. A ceramic implant comprising a sintered body of zirconia and a coating layer of a porous sintered body of a mixture comprising hydroxyapatite and zirconia on the surface of the sintered body of zirconia.

4,983,183

HIP PROSTHESIS AND METHOD FOR IMPLANTING THE SAME

Stephen M. Horowitz, 1233 York Ave., Apt. 7L, New York, N.Y. 10021

Division of Ser. No. 306,946, Feb. 6, 1989. This application Sep. 21, 1989, Ser. No. 410,666

Int. Cl.[5] A61F *2/32, 2/30*

U.S. Cl. 623—23 **8 Claims**

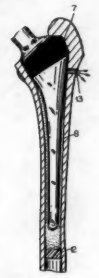
1. A method of implanting a dual mode fixation hip prosthesis in a patient, the improvement comprising:

preparing the intramedullary canal of the femoral stem;

making a through hole in the lateral aspect of a patient's hip around the level of the lesser trochanter;

injecting cement into the intramedullary canal wherein said hole drains out any excess cement thus maintaining the cement level below the level of the hole and;

inserting a hip prosthesis having a distal stem portion adapted to be affixed by the cement and a proximal portion having a porous coating wherein said proximal portion is positioned above said hole such that excess cement drains out of the hole thereby maintaining the cement



level below the proximal portion and allowing bone ingrowth into the porous coating and achieving dual modes of fixation of the prosthesis.

4,983,184

ALLOPLASTIC MATERIAL FOR PRODUCING AN ARTIFICIAL SOFT TISSUE COMPONENT AND/OR FOR REINFORCING A NATURAL SOFT TISSUE COMPONENT

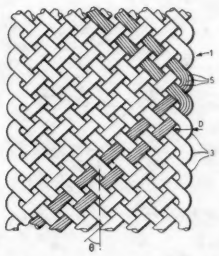
Samuel G. Steinemann, St. Sulpice, Switzerland, assignor to Institut Straumann AG, Waldenburg, Switzerland

Filed Oct. 5, 1988, Ser. No. 254,366

Claims priority, application Switzerland, Oct. 16, 1987, 4081/87

Int. Cl.[5] A61F *2/02, 2/08*

U.S. Cl. 623—66 **32 Claims**



1. Alloplastic material for making at least one of an artificial soft tissue component and a reinforcement for a natural soft tissue component in a human or animal body, wherein the material comprises fibers of a thickness less than 20 micrometers, the fibers contain an alloy having a phase structure of one of alpha-beta type and beta type and said fibers arranged in a regular pattern.

4,983,185

DYEING OF LEATHER WITH PIGMENTS

Rolf Streicher, Worms; Ortwin Schaffer, Ludwigshafen; Horst Belde, Lugwigshafen, and Paul Guenthert, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,712

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818183

Int. Cl.[5] D06P *3/60*

U.S. Cl. 8—436 5 Claims

1. A process for dyeing leather with a pigment in an aqueous liquor, which comprises treating the leather at from 20° to 60° C. with a pigment in the presence of an alkoxylated amine of 20 or more carbon atoms wherein the amine is a secondary or tertiary amine which has hydrocarbon radicals which are saturated or unsaturated and one or more of which is interrupted by one or more oxygen atoms.

4,983,186

METHODS AND COMPOSITIONS FOR REDUCTION OF DRAG IN HYDROCARBON FLUIDS

Michael I. Naiman, St. Louis, and James C. Chang, Manchester, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 18, 1989, Ser. No. 381,232

Int. Cl.[5] C10L *1/18*

U.S. Cl. 44—394 18 Claims

1. A method for reducing friction loss in flowing hydrocarbon fluids, comprising adding to the fluid an effective amount of an oil-soluble polyamine and a terpolymer of styrene, alkyl acrylate and a carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid.

4,983,187

METHOD FOR PREPARING A HIGH-CONCENTRATION SOLIDS SUSPENSION IN WATER

Vincenzo Laganá, Milan; Darió Ercolani, and Elio Donati, both of Fano, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Jan. 3, 1989, Ser. No. 293,092

Claims priority, application Italy, Jan. 21, 1988, 19143 A/88

Int. Cl.[5] C10L *9/10, 1/32*

U.S. Cl. 44—280 9 Claims

1. A method for preparing a high-concentration coke or petcoke solids suspension in water which can be transported by pipe and burnt with low emission of harmful substances, comprising:

(i) crushing the solid to be suspended to a maximum particle size of 6 mm, and then

(ii) wet-grinding the crushed solid in the presence of additives in aqueous solution to a maximum solid particle size of 300 μm;

wherein either before said crushing or immediately before said wet-grinding, a first desulphurizer which is one member selected from the group consisting of $CaCO_3$, $MgCO_3$, dolomite, and mixtures thereof is added, in a molar ratio relative to sulphur contained in said solid of between 1.5 and 3, and

adding immediately before or during said wet-grinding a second desulphurizer which possesses stabilizing and anticorrosive properties and is one member selected from the group consisting of MgO, $Mg(OH)_2$, CaO, $Ca(OH)_2$, and mixtures thereof, in a quantity of between 0.04 and 0.4% by weight of the final suspension.

4,983,188

APPARATUS FOR RELIEVING A LOCK CHAMBER FOR ASH FROM PRESSURE

Horst Mielke, Neu Isenburg; Gerhard Schmitt, Schmitten, and Peter Herbert, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 495,240

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911752

Int. Cl.[5] C10J *3/72*

U.S. Cl. 48—87 2 Claims

1. A lock container, communicating with a reactor operated under a pressure of at least 2 bars to gasify or combust solid fuels, the lock container arranged to remove ash from the reactor comprising a pressure relief line to effect pressurization and depressurization, a filter element in the container and in communication with the pressure relief line, wherein the filter element is permeable to gas and substantially impermeable to solids and is positioned within the lock container in such a location such that at least one half of the filter element is surrounded by ash during a relief of pressure with the lock container being filled with ash to a predetermined level.

4,983,189

METHODS AND APPARATUS FOR MOVING AND SEPARATING MATERIALS EXHIBITING DIFFERENT PHYSICAL PROPERTIES

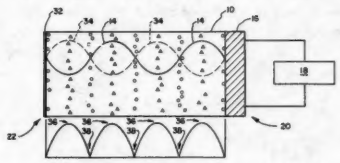
Stephen C. Peterson; Owen D. Brimhall; Thomas J. McLaughlin, al of Salt Lake City; Charles D. Baker, Lehi, and Sam L. Sparks, Alpine, all of Utah, assignors to Technical Research Associates, Inc., Salt Lake City, Utah

Continuation of Ser. No. 832,248, Feb. 21, 1986, Pat. No. 4,759,775. This application Jul. 25, 1988, Ser. No. 224,441

The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.

Int. Cl.[5] B01D *43/00*

U.S. Cl. 55—15 43 Claims



25. A method for separating undissolved gases from a liquid, the method comprising the steps of:

moving the undissolved gases and the liquid in a continuous flow through a separation vessel;

propagating a first acoustic wave of a first frequency at least as great as one megahertz through the separation vessel;

propagating a second acoustic wave of a second frequency through the separation vessel, said second frequency being different from the first frequency;

superimposing the first and second acoustic waves to form a pseudo-standing acoustic wave having a group velocity, said pseudo-standing acoustic wave comprising maximum and minimum pressure surfaces that move with the group

velocity of the pseudo-standing acoustic wave, said maximum and minimum pressure surfaces moving the undissolved gases towards a location in the vessel in the direction of the group velocity of the pseudo-standing acoustic wave; and

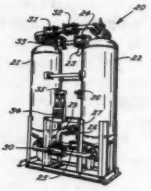
separating the undissolved gases from the liquid.

4,983,190

PRESSURE-SWING ADSORPTION SYSTEM AND METHOD FOR NBC COLLECTIVE PROTECTION

Marcel G. Verrando, Ocala, Fla.; Donald H. White, Homer, N.Y.; Evan E. Koslow, Westport, Conn., and Phillip G. Barkley, Cortland, N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed May 21, 1985, Ser. No. 736,479
Int. Cl.[5] B01D *53/02, 39/00*
U.S. Cl. 55—21 **28 Claims**



1. A method of removing chemical and biological warfare agents from air for human consumption comprising the steps of:

(a) compressing the air to substantially above atmospheric pressure,

(b) purifying the compressed air in a pressure-swing adsorber of the kind having at least one adsorbent bed capable of being regenerated, said adsorbent having pores having an internal diameter substantially in excess of five Angstroms and of about ten Angstroms, and

(c) filtering the compressed air through a filter intercepting particulates in excess of about one micrometer (1μm) in diameter.

4,983,191

PRODUCTION OF AROMATIC POLYIMIDE MEMBRANES

Okan M. Ekiner, Wilmington, Del., and Richard A. Hayes, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. and L'Air Liquide S.A., Paris Cedex, France

Filed Oct. 10, 1989, Ser. No. 418,835
Int. Cl.[5] B01D *53/22, 71/64*
U.S. Cl. 55—158 **16 Claims**

9. A gas separation membrane comprising a blend of an aromatic polymer having an imide linkage in its backbone and sufficient oligomeric or polymeric residue of a sufficient molecular weight, said residue being soluble in the gas separation membrane.

4,983,192

TEXTILE SHEET FILTER

Hubert von Blücher, Freytagstrasse 45; Hasso von Blücher, Sohnstrasse 58, both of D-400 Düsseldorf, and Ernest de Ruiter, Höhenstrasse 57a, D-5090 Leverkusen 3, all of Fed. Rep. of Germany

Division of Ser. No. 215,860, Jul. 6, 1988, abandoned, which is a continuation of Ser. No. 641,085, Aug. 15, 1984, abandoned, which is a continuation of Ser. No. 456,459, Jan. 7, 1983, abandoned. This application Mar. 3, 1989, Ser. No. 319,399
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200959
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—387 **1 Claim**

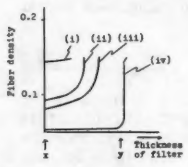
1. A sheet filter comprising a pile fabric carrying micrometric particles of activated carbon, the base of the pile fabric comprising fusion-resistant fibers and the pile of the fabric comprising fusible fibers, the fusible fibers comprising undrawn amorphous polyester fibers which upon heating to about 80° to 85° C. become temporarily adhesive without fusing, the fabric having been heated under pressure thereby to secure the carbon particles to the pile.

4,983,193

FILTER AND PROCESS FOR THE PRODUCTION THEREOF

Yatsuhiro Tani, Kyoto; Susumu Ohmori, and Hideki Komagata, both of Otsu, all of Japan, assignors to Toyo Koseki Kabushiki Kaisha, Osaka and Nippondenso Co., Ltd., Kariya, both of, Japan

Continuation of Ser. No. 634,194, Jul. 27, 1984, abandoned, which is a continuation of Ser. No. 522,248, Aug. 11, 1983, abandoned, which is a continuation of Ser. No. 320,984, Nov. 12, 1981, abandoned. This application Dec. 21, 1989, Ser. No. 453,220
Claims priority, application Japan, Nov. 12, 1980, 55-159959
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—487 **3 Claims**



1. A filter having an inlet side and an outlet side, comprising at least two different types of fibers having a denier of 0.001 to 15 bonded to each other with a powdery binder of 10 to 80% by weight based on the weight of webs, said binder being hot-adhered to the webs, said filter having a fiber density of 0.01 to 0.1 at the inlet side and a fiber density of 0.05 to 0.5 at the outlet side, said filter having a continuous fiber density gradient from the inlet side to the outlet side owing to a continuous distribution gradient of the powdery binder which bonds to the fibers while having a uniform distribution of the different types of fiber so that dust collection efficiency varies continuously from low efficiency at the inlet side to high efficiency toward the outlet side, thereby preventing formation of a dust cake at the inlet side and promoting uniform collection of dust throughout the thickness of the filter between the inlet and outlet sides, said fiber density gradient corresponding to an exponential curve defined by the following equation:

$$\alpha = \alpha_i \cdot \exp \cdot \left(\frac{a}{\sqrt[3]{\alpha_i}} \times \frac{l}{lo} \right)$$

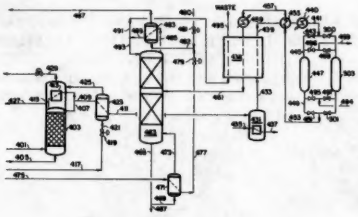
wherein
α is the fiber density at a distance: l,
α_i is the fiber density at the fluid inlet side,
a is a constant: 0.35–0.64,
lo is the thickness of the filter, and
l is the distance from a face at the fluid inlet side in the direction of the filter thickness.

4,983,194

PRODUCTION OF HIGH PURITY ARGON

Jeffrey A. Hopkins, Whitehall; Roger M. McGuinness, Macungie; Rakesh Agrawal, and Steven L. Feldman, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 2, 1990, Ser. No. 475,070
Int. Cl.[5] F25J *3/06*
U.S. Cl. 62—22 **17 Claims**



1. A process for the production of high purity argon comprising:
(a) recovering an argon-enriched sidestream from a low pressure column of a cryogenic air separation distillation system comprising a high pressure column, said low pressure column, an argon sidearm column, and a main heat exchanger;
(b) passing said argon-enriched sidestream into said argon sidearm column and withdrawing therefrom a crude argon stream containing less than about 0.8 mol % oxygen; and
(c) passing said crude argon stream into a final purification system comprising a combination of a getter system for the removal of oxygen by chemical reaction with a metal-containing getter catalyst and an argon purification distillation column for the removal of impurities other than oxygen, and withdrawing from said final purification system a stream of said high purity argon.

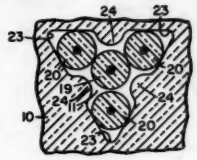
4,983,195

METHOD OF MAKING FIBER OPTIC COUPLER WITH LONGITUDINAL PROTRUSIONS

Daniel E. Nolan, and Gregory E. Williams, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jan. 4, 1990, Ser. No. 461,100
Int. Cl.[5] C03B *23/20*
U.S. Cl. 65—4.2 **19 Claims**

1. A method of making a fiber optic coupler comprising the steps of
providing a glass tube having first and second opposite end portions and a midregion, a longitudinal aperture extending from a first end of said tube to a second end thereof,
disposing within the midregion of said longitudinal aperture at least a portion of each of a plurality of glass optical fibers, at least that part of each fiber that is located in the tube midregion having no coating thereon,
collapsing the midregion of said tube onto said fibers, and
stretching at least a portion of said midregion,



said tube aperture having M equally spaced, longitudinally extending, nonplanar inwardly projecting protrusion means, wherein M is at least 3, the region between each two adjacent protrustion means constituting a corner region along which one of said fibers extends, said protrusion means retaining said fibers in their relative positions during said step of collapsing.

4,983,196

METHOD OF MOLDING ENAMEL COATED GLASS SHEET WITHOUT ADHESION TO DIE

David M. Stotka, Washington, Pa., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 150,261, Jan. 29, 1988, abandoned. This application Nov. 9, 1988, Ser. No. 270,397
Int. Cl.[5] C03B *40/02*
U.S. Cl. 65—24 **11 Claims**

1. In the method for forming a glass enamel coated glass sheet, the glass enamel composition comprising a glass frit, a metal oxide pigment and a vehicle for the glass enamel, wherein the glass enamel composition is coated onto the glass sheet, the coated glass sheet is then heated to soften the sheet, to remove the volatiles in said enamel and to bond the remainder of the enamel to the sheet, the softened coated glass sheet is then contacted with a fibrous material covered forming die, the forming die is then removed and the glass sheet cooled; the improvement comprising prior to coating the frit onto the glass sheet incorporating into the enamel composition from about 2–75%, by weight, of iron metal powder whereby said enamel composition exhibits virtually no adhesion to the fibrous material during the period which it contacts said fibrous material of said forming die in the glass sheet contacting step.

4,983,197

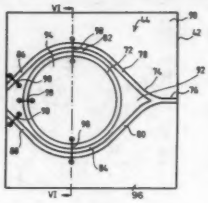
METHOD FOR PRODUCING WAVEGUIDES IN A GLASS SUBSTRATE BY ION EXCHANGE

Edilbert A. K. Froning, Bodanstr. 23, 7772 Oberubldingeu, and Klaus A. Langner, Alte Dorfstrasse 61, 7770 Überlingeu, both of Fed. Rep. of Germany

Filed Jul. 20, 1989, Ser. No. 382,845
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3826942
Int. Cl.[5] C03C *21/00*
U.S. Cl. 65—30.13 **4 Claims**

1. A method of providing waveguides in a glass substrate by ion exchange, comprising the steps of
(a) applying a metal mask to the surface of said glass substrate, said metal mask having lands covering said surface and apertures in which said surface is exposed, part of said lands being separated from other of said lands by apertures therebetween,
(b) interconnecting said separated lands by electrical conductors different from said lands to establish equal electrical potentials on all said lands of said metal mask, and
(c) bringing said glass substrate and said mask into contact with molten metallic salt which contains ions of a first type to be exchanged for ions of a second type in said glass

substrate, whereby ions of said first type are exchanged for ions of said second type in said exposed surface to



change the refractive index of said glass substrate below said exposed surface and thereby to provide said waveguides.

4,983,198

GLASS MELTING METHOD AND APPARATUS

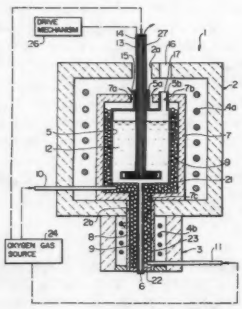
Kazuo Ogino, Hinode, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,190

Claims priority, application Japan, Feb. 29, 1988, 63-47119

Int. Cl.[5] C03B *5/167*

U.S. Cl. 65—32.5 **16 Claims**



1. A method of melting phosphate glass having high reducing activity when melted, said method comprising the steps of:

charging a phosphate glass raw material into a melting vessel having a wall formed of either one of platinum and alloy thereof;

heating the phosphate glass raw material within said melting vessel to melt it; and

supplying oxygen gas to an outer surface of said melting vessel to raise oxygen partial pressure within an atmosphere surrounding said melting vessel so as to cause the oxygen gas to penetrate through the wall of said melting vessel, thereby supplying the penetrated oxygen to a layer of the molten phosphate glass which is in contact with an inner surface of the wall of said melting vessel, the concentration of oxygen being sufficient so that the layer of the molten phosphate glass is formed into a protective glass layer rich in oxygen, for protecting the wall of said melting vessel from the molten phosphate glass.

4,983,199

CRYSTAL CONTAINER TREATED TO IMPEDE THE MIGRATION OF LEAD TO THE CONTAINER'S CONTENTS

Jean Dumas, Marzelay, France, assignor to Compagnie des Cristalleries de Baccarat, Baccarat, France

Division of Ser. No. 174,918, Mar. 19, 1988. This application Feb. 9, 1990, Ser. No. 477,648

Claims priority, application France, Feb. 29, 1988, 88 02668

Int. Cl.[5] C03C *17/02*

U.S. Cl. 65—60.5 **2 Claims**

1. A process for making a lead crystal container comprising the steps of:

gathering a predetermined quantity of flowable unleaded glass into a drop shape;

gathering a parison of crystal over said unleaded glass so as to cover said unleaded glass, said unleaded glass and said crystal having close to the same coefficient of expansion and index of refraction; and

blowing said crystal and unleaded glass together to a desired container configuration having a cavity with an internal surface for holding a product in the container, the entire internal surface being covered with a continuous film of said unleaded glass.

4,983,200

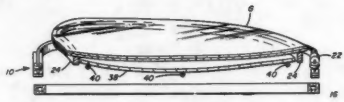
GLASS SHAPING RING HAVING A THERMAL INSULATING MEMBER AND METHOD OF SHAPING GLASS SHEETS USING SAME

Thomas J. Reese, Sarver, and David B. Rayburn, Vandergrift, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 13, 1989, Ser. No. 406,476

Int. Cl.[5] C03B *23/027*

U.S. Cl. 65—103 **5 Claims**



1. In a method of shaping heat softenable sheet by sag bending, wherein the method includes the steps of positioning a sheet to be shaped on a shaping rail of a sag bending mold, the shaping rail defining an area, heating the sheet to its deformation temperature to sag the sheet on the shaping rail to shape the sheet, and cooling the shaped sheet while supported on the shaping rail, wherein during the cooling of the sheet the mold radiates heat and air circulates beneath the shaped sheet resulting in non-uniform cooling of the sheet which results in localized high tensile stresses in portions of the sheet, the improvement comprising:

providing a thermal insulating member below the sheet and substantially throughout the area defined by the shaping rail to even out the cooling rate of the sheet by insulating the sheet from the radiated heat and circulating air to reduce tensile stresses in the sheet.

4,983,201

METHOD AND APPARATUS IN A GLASS SHEET BENDING FURNACE FOR PREVENTING THE DEFLECTION OF MOULD WAGON BEARING RAILS

Esko J. Peltonen, Kangasala, Finland, assignor to Tamglass Oy, Tampere, Finland

Filed Nov. 14, 1989, Ser. No. 436,000

Claims priority, application Finland, Nov. 24, 1988, 885449

Int. Cl.[5] C03B *23/025, 35/14*

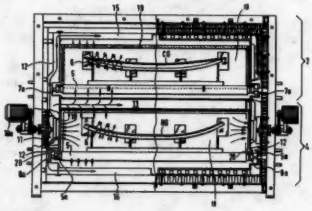
U.S. Cl. 65—104 **6 Claims**

1. A method for resisting the deflection of mould wagon bearing rails in a glass sheet bending furnace which includes a top array of successive heating sections for heating glass sheets

and a bottom array of successive cooling sections for cooling the glass sheets, said method comprising:

conveying a mould wagon which includes bearing rails and which carries a glass sheet through said heating and cooling sections along a conveyor track on which said bearing rails rest; and

blasting cooling air against top surfaces of said bearing rails of said mould wagon in at least one of said cooling sections to thereby resist deflection of said bearing rails.

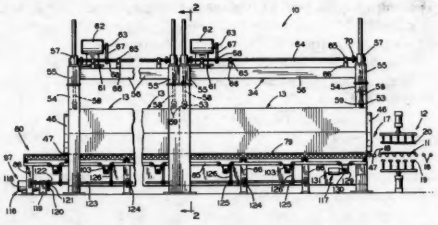


4,983,202

GLASS SHEET HEATING FURNACE AND METHOD OF USING

Sugato Deb, Perrysburg; John C. Hovis, Elmore, both of Ohio, and Michael L. Pollock, Petersburg, Mich., assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Feb. 27, 1990, Ser. No. 485,643
Int. Cl.[5] C03B *23/02*
U.S. Cl. 65—104 **23 Claims**



21. A method of heating glass sheets according to a desired non-uniform pattern across their width as said sheets are conveyed through an elongated enclosed heating furnace upon aligned roller members comprising, providing a refractory cap over said rollers and said glass sheets conveyed thereon having a profile which is curved from one side edge to the other, matching said profile to said desired heating pattern whereby the degree of curvature of said cap is greater opposite areas across said sheets to be heated to higher temperatures than opposite areas where less heating is desired, and supplying radiant heat along said profile from said cap to said sheets.

4,983,203

COOLING DEVICE FOR GLASS CONTAINER FORMING MACHINE

Roger Erb; Robert Johnson, both of Marion, and Richard Smith, Uplant, all of Ind., assignors to American National Can Company, Chicago, Ill.

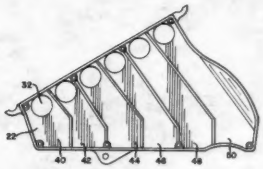
Filed Jan. 17, 1990, Ser. No. 466,209
Int. Cl.[5] C03B *9/38*
U.S. Cl. 65—265 **11 Claims**

1. An air cooling mechanism for the blank mold-side of a machine for molding glass objects from molten glass, said mechanism comprising:

a. a mold, said mold having a plurality of air passages therethrough;

b. a plenum defining a pressure chamber, said plenum including a slot defining an exit for the passage of air from said plenum through said air passages of said mold;

c. stationary air supply means for supplying pressurized air, and to which said plenum is fixed, and wherein said mold is spaced apart from and not in contact with said stationary air supply means; and



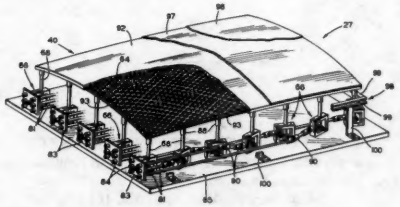
d. pivot means for pivoting said mold from a first position where said mold engages an article to be molded, to a second position away from said article to be molded, and wherein the ends of said air passages are in registry with said slot to effect the passage of air from said plenum and through said air passages.

4,983,204

APPARATUS FOR BENDING GLASS SHEETS

John W. Borer, Toledo, Ohio, and Lowell J. Conner, Lathrop, Calif., assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Dec. 20, 1989, Ser. No. 453,678
Int. Cl.[5] C03B *23/02*
U.S. Cl. 65—273 **17 Claims**



1. An adjustable mold for use in bending a heat-softened glass sheet, comprising a rigid base plate, a continuous shaping element having a surface configuration corresponding generally to the curvature to which the glass sheet is to be bent, said shaping element including a sheet of flexible expanded metal, a resilient body portion covering said expanded metal, and a plurality of spaced, adjustable support means affixed to said rigid base plate for adjustably supporting said sheet of expanded metal in spaced relation to said rigid base plate, each said adjustable support means being adapted for selectively varying the distance between an associated area of said sheet of expanded metal and said rigid base plate to maintain said surface configuration in conformity with said curvature to which said glass sheet is to be bent.

4,983,205

APPARATUS FOR BENDING GLASS PLATES

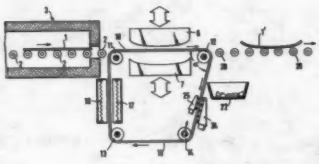
Hans-Werner Kuster, Aachen, Fed. Rep. of Germany; Luc Vanaschen, Eupen, Belgium, and Hans-Josef Promper, Aachen, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Mar. 15, 1990, Ser. No. 493,792

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1989, 3908644

Int. Cl.[5] C03B *23/033*

U.S. Cl. 65—290 11 Claims



1. Apparatus for bending and tempering glass plates comprising:

a horizontal furnace for heating the glass plates to the bending temperature and having a conveyor for moving the glass plates therethrough in a direction of movement;

a press bending station having bending tools and following the furnace in the direction of movement of the glass plates;

a cooling station following the press bending station; and

a flexible conveyor belt between the roller furnace and the cooling station and comprising means for horizontally conveying the glass plate into the bending station, wherein the glass plate and the conveyor belt are together bent by said bending tools and conveyed in bent form on said conveyor belt into the cooling station;

wherein said bending tools in the press bending station comprise water-cooled, full-surface bending molds which contact the glass plates to temper the glass plates by full surface contact therewith, and wherein the conveyor belt is made from a woven or knitted fabric of heat-resistant metal fibers and has in a direction at right angles to the plate of the conveyor belt a heat resistivity of less than $5\times10^{-3}m^2\times K\times W^{-1}$.

4,983,206

BATCH CHARGER FOR GLASS FURNACE

Angelo J. Trunzo, Washington, Pa., assignor to Frazier-Simplex, Inc., Washington, Pa.

Filed Mar. 16, 1990, Ser. No. 494,770

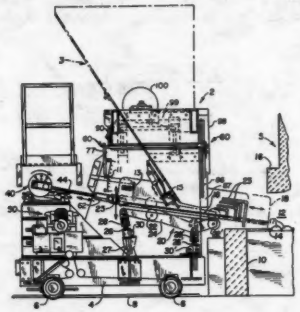
Int. Cl.[5] C03B *3/00*

U.S. Cl. 65—335 20 Claims

1. A batch charger for feeding raw batch material to a glass making furnace of the type having a main support frame with a raw batch hopper chute therein, and a reciprocable charger plate positioned under the hopper chute for receiving raw batch material therefrom, the improvement comprising:

(a) jacking means positioned beneath the charger plate for independently raising and lowering front and rear ends of the charger plate;

(b) adjustable batch gate means associated with the hopper chute including rotatable shaft means having a first end positioned at a rear face of the batch charger and operably coupled by gear means at a second end to a vertically moveable batch gate positioned at a front face of the batch charger for selectively raising and lowering said batch gate by rotative movement of the first end of the shaft means; and



(c) adjustable crank means for regulating a stroke length of said reciprocal charger plate.

4,983,207

FUNGICIDES AND PLANT-GROWTH CONTROLLING AGENTS

Thomas Strumpf, Potsdam; Horst Lyr, Eberswalde; Dieter Zanke, Potsdam-Babelsberg; Gerlinde Zollfrank nee Baumann, Potsdam, all of German Democratic Rep.; Gyula Oros; Ferenc Virányi, both of Budapest, Hungary, and Tibor Ersek, Columbia, Mo., assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Filed Mar. 3, 1986, Ser. No. 835,608

Claims priority, application German Democratic Rep., Mar. 4, 1985, 273728

Int. Cl.[5] A01N *43/80, 43/84*

U.S. Cl. 71—88 1 Claim

1. A fungicidal composition effective against Phytophthora Cinnamomi and effective in regulating plant growth containing as active ingredients:

N-alkyl (C_{12})-2,6-dimethylmorpholine; and

N-isoxazol-5-yl-N-(2,6-xylyl)-alanine methyl ester; in a weight ratio of 4:1, together with a fungicidally acceptable inert carrier.

4,983,208

FUNGICIDAL AND PLANT GROWTH-REGULATING HYDROXYALKYL-AZOLYL DERIVATIVES

Klaus Stroech, Solingen; Monika Frie, Odenthal; Thomas Himmler, Cologne; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

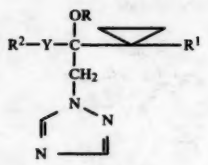
Division of Ser. No. 216,690, Jul. 7, 1988, Pat. No. 4,925,482. This application Sep. 14, 1989, Ser. No. 406,996

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722794; Apr. 25, 1988, 3813874

Int. Cl.[5] A01N *43/653;* C07D *249/08*

U.S. Cl. 71—92 8 Claims

1. A hydroxyalkyl-azolyl derivative, or addition product thereof with an acid or metal salt, of the formula



(I)

in which

R represents hydrogen, alkyl having 1 to 6 carbon atoms or alkylcarbonyl having 1 to 6 carbon atoms in the alkyl part,

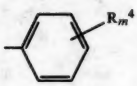
R^1 represents the grouping —Z—R^3,

wherein

Z represents oxygen, sulphur, SO or SO_2 and

R^3 represents alkyl having 1 to 6 carbon atoms, which is optionally substituted by alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, phenyl and/or halogen, phenyl which is optionally substituted by halogen, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 halogen atoms, alkyl having 1 to 4 carbon atoms and/or alkoxy having 1 to 4 carbon atoms, or benzyl which is optionally substituted in the phenyl part by halogen, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 halogen atoms, alkyl having 1 to 4 carbon atoms and/or alkoxy having 1 to 4 carbon atoms,

R^2 represents alkyl having 1 to 6 carbon atoms, which is optionally substituted by alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, phenyl and/or halogen, cycloalkyl having 3 to 8 carbon atoms which is optionally substituted by alkyl having 1 to 4 carbon atoms and/or halogen, naphthyl which is optionally substituted by alkyl having 1 to 4 carbon atoms and/or halogen, or the radical of the formula

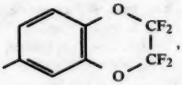


wherein

R^4 represents fluorine, chlorine, bromine, methyl, ethyl, isopropyl, tert.-butyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, or nitro, amino, alkylamino having 1 to 4 carbon atoms in the alkyl group, dialkylamino having 1 to 4 carbon atoms in each alkyl group, phenylamino or alkylcarbonylamino having 1 to 4 carbon atoms in the alkyl group and

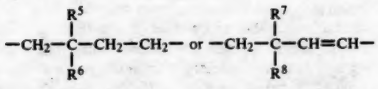
m represents the numbers 0, 1, 2 or 3, or

R^2 represents the radical of the formula



and

Y represents the groupings $—CH_2—CH_2—$, —CH=CH—, —C≡C—,



wherein

R^5, R^6, R^7 and R^8 independently of one another represent hydrogen, methyl or ethyl.

4,983,209

4,5-DIHYDRO-1H-1,2,4-TRIAZOLE-3-CARBOXAMIDE DERIVATIVES AND HERBICIDAL COMPOSITION CONTAINING THE SAME

Takafumi Shida; Yoshikazu Kubota; Isao Ichinose; Takeo Watanabe; Shiro Yamazaki, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,465

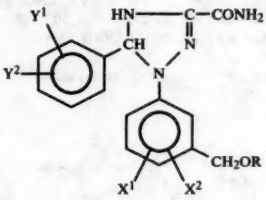
Claims priority, application Japan, Mar. 27, 1987, 62-73709

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] C07D *249/08;* A01N *43/653*

U.S. Cl. 71—92 **7 Claims**

1. A 4,5-dihydro-1H-1,2,4-triazole-3-carboxamide derivative represented by the formula (I):



(I)

wherein R represents a straight-chain alkyl group having 1 to 10 carbon atoms which is non-substituted or substituted with 1 to 19 fluorine atoms or a branched alkyl group having 3 to 10 carbon atoms which is non-substituted or substituted with 1 to 19 fluorine atoms; Xl represents a halogen atom or an alkyl group having 1 to 3 carbon atoms; X^2 represents hydrogen atom, a halogen atom or an alkyl group having 1 to 3 carbon atoms; Y^1 represents hydrogen atom or fluorine atom; and Y^2 represents hydrogen atom or fluorine atom.

4,983,210

ISOXAZOLINES, THEIR PREPARATION AND THEIR USE

Joachim Rheinheimer, Ludwigshafen; Karl Eicken, Wachenheim; Hans Theobald, Limburgerhof; Thomas Kuekenhoehner, Frankenthal; Karl-Otto Westphalen, Speyer; Bruno Wuerzer, Otterstadt; Juergen Frank, Schwetzingen, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

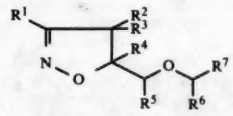
Filed Mar. 22, 1989, Ser. No. 326,986

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809765

Int. Cl.[5] C07D *261/04, 403/04, 403/12;* A01N *43/80*

U.S. Cl. 71—94 **3 Claims**

1. An isoxazoline of the formula I



where the substituents have the following meanings:

R^1 is phenyl substituted by from one to five halogens and from one to three of the groups C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkyl; or phenyl substituted by from one to five halogens or by from one to three of the groups C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkyl

R^2, R^3, R^4, R^5 and R^6 are hydrogen, C_1–C_4-alkyl or benzyl and

R^7 is C_2–C_6-alkenyl or C_5–C_7-cycloalkenyl, or C_2–C_6-alkenyl or C_5–C_7-cycloalkenyl substituted by one to three phenyl radicals and halogen atoms, or C_2–C_6-alkenyl or C_5–C_7-cycloalkenyl substituted by one to three; phenyl radicals or halogen atoms; unsubstituted phenyl or phenyl substituted by from one to three of the following substituents: C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, phenyl, phenoxy, cyano and halogen; or unsubstituted naphthyl or thienyl, or naphthyl or thienyl substituted by from one to three C_1–C_4-alkyl groups and halogen atoms, or naphthyl or thienyl substituted by from one to three C_1–C_4-alkyl groups or halogen atoms.

4,983,211

SUBSTITUTED CYCLOHEXANEDIONES AND THEIR HERBICIDAL USE

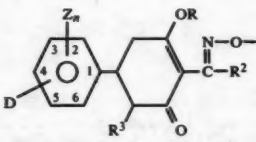
Lowell D. Markley; Christopher T. Hamilton, both of Midland, Mich.; Beth A. Swisher, Fairfield, Calif., and Jacob Secor, Midland, Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Mar. 30, 1990, Ser. No. 503,342

Int. Cl.[5] A01N *43/00, 43/40;* **C07D** *213/62, 239/32*

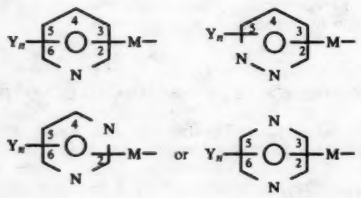
U.S. Cl. 71—94 **24 Claims**

1. A substituted cyclohexanedione compound corresponding to the formulae



Wherein

D is a group corresponding to one of the formulae,



R represents hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkenyl, C_3–C_4 alkynyl, C_1–C_4 alkylsulfonyl, phenylsulfonyl or acyl;

R^1 represents C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkenyl, C_2–C_4 haloalkenyl, C_3–C_4 alkynyl, or C_3–C_4 haloalkynyl;

R^2 represents C_1–C_4 alkyl, C_1–C_4 fluoroalkyl, C_1–C_4 alkylthiomethyl, C_1–C_4 alkoxymethyl, C_2–C_4 alkenyl or C_3–C_4 alkynyl;

R^3 represents hydrogen or C_1–C_4 alkoxycarbonyl;

each Z independently represents hydrogen, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy or $—CF_3$;

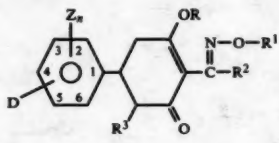
M represents $=O$, $=S$, $=S(O)$ or $=S(O)_2$;

Y represents hydrogen, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl or C_1–C_4 alkylsulfonyl or $—CF_3$, with the proviso that when M is $=S(O)$, Y cannot be C_1–C_4 alkylthio and when M is $=S(O)_2$, Y cannot be C_1–C_4 alkylthio or C_1–C_4 alkylsulfinyl; and

n represents the integer 0, 1, 2 or 3;

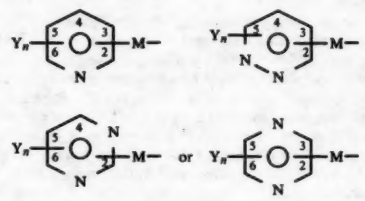
and the herbicidally acceptable organic and inorganic salts thereof.

9. A herbicidal composition which comprises an inert carrier in intimate admixture with a herbicidally effective amount of an active ingredient which is a substituted cyclohexanedione compound corresponding to the formula



Wherein

D is a group corresponding to one of the formulae,



R represents hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkenyl, C_3–C_4 alkynyl, C_1–C_4 alkylsulfonyl, phenylsulfonyl or acyl;

R^1 represents C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkenyl, C_2–C_4 haloalkenyl, C_3–C_4 alkynyl, or C_3–C_4 haloalkynyl;

R^2 represents C_1–C_4 alkyl, C_1–C_4 fluoroalkyl, C_1–C_4 alkylthiomethyl, C_1–C_4 alkoxymethyl, C_2–C_4 alkenyl or C_3–C_4 alkynyl;

R^3 represents hydrogen or C_1–C_4 alkoxycarbonyl;

each Z independently represents hydrogen, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy or $—CF_3$;

M represents $=O$, $=S$, $=S(O)$ or $=S(O)_2$;

Y represents hydrogen, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl or C_1–C_4 alkylsulfonyl or $—CF_3$, with the proviso that when M is $=S(O)$, Y cannot be C_1–C_4 alkylthio and when M is $=S(O)_2$, Y cannot be C_1–C_4 alkylthio or C_1–C_4 alkylsulfinyl; and

n represents the integer 0, 1, 2 or 3;

and the herbicidally acceptable organic and inorganic salts thereof.

4,983,212

CERMET ALLOYS AND COMPOSITE MECHANICAL PARTS MADE BY EMPLOYING THEM

Yuusuke Iyori, and Hidetoshi Yokoo, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

PCT No. PCT/JP88/01082, § 371 Date Jun. 23, 1989, § 102(e) Date Jun. 23, 1989, PCT Pub. No. WO89/03896, PCT Pub. Date May 5, 1989

PCT Filed Oct. 26, 1988, Ser. No. 381,706

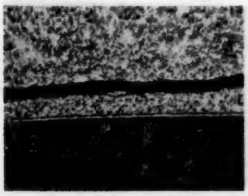
Claims priority, application Japan, Oct. 26, 1987, 62-268053; Dec. 11, 1987, 62-313643

Int. Cl.[5] C22C *29/04*

U.S. Cl. 75—238 **11 Claims**

1. A cermet alloy consisting essentially of 30 to 70% by weight of a hard phase and a balance of a binding phase and unavoidable impurities, said hard phase comprising 20 to 50% by weight of at least one selected from the group consisting of the carbides of the Group IVa, Va and VIa elements and nitrides of Zr, V, Nb and Ta, and further containing at least

one selected from the group consisting of titanium carbide, titanium nitride, and titanium carbonitride, while said binding



phase contains 20 to 40% by weight of nickel and 5 to 30% by weight of chromium.

4,983,213

TITANIUM HYDRIDE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 420,416, Oct. 12, 1989. This application Jun. 25, 1990, Ser. No. 542,543
Int. Cl.[5] B22F *01/00*
U.S. Cl. 75—252 **1 Claim**

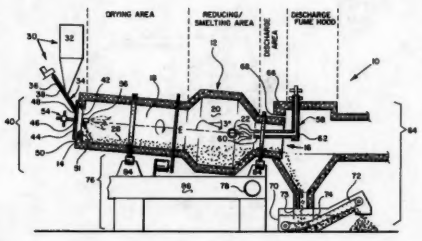
1. A powder admixture of 97.75% minus 325 mesh atomized powder mixed with 2.25% minus 325 mesh titanium hydride powder, the atomized powder having the following composition, in weight percent: 94.12 Cu; 3.07 Al; 2.81 Si.

4,983,214

METHOD AND APPARATUS FOR DIRECT REDUCTION OF METAL OXIDES

N. Edward Bottinelli, Dallas, Tex.; Norman L. Kotraba, Tega Cay, S.C., and Norman G. Bishop, Houston, Tex., assignors to Zia Technology, Inc., Dallas, Tex.

Filed Feb. 13, 1990, Ser. No. 479,769
Int. Cl.[5] F27B *7/42*; C21B *13/08*
U.S. Cl. 75—387 **34 Claims**



1. Apparatus for direct reduction of metal oxides, using a rotary kiln, fed with greenball pellets, said kiln having a feed-end and a discharge end, and comprising:

(a) a first chamber within said kiln, adjacent to said feed-end, for drying, preheating and indurating said greenball pellets;

(b) means for feeding said greenball pellets into said first chamber;

(c) means for sealing said feed-end and preventing egress of process gas from said kiln into the atmosphere and ingress of the atmosphere into said kiln;

(d) means for drying, preheating and indurating said greenball pellets within said first chamber;

(e) a second chamber within said kiln, adjacent to and connected with said first chamber, having a diameter greater than said first chamber, for reducing said pellets, said second chamber being adjacent to said discharge end;

(f) means for reducing said pellets within said second chamber;

(g) means for discharging said reduced pellets from said discharge end; and

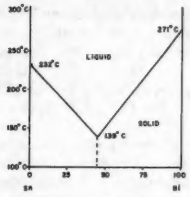
(h) means, including a support frame, for varying the axial angle of said kiln and regulating the flow of said pellets from said first chamber to said second chamber.

4,983,215

NOVEL LIQUID METAL SEAL ON ZIRCONIUM OR HAFNIUM REDUCTION APPARATUS

Ronald E. Walsh, Jr., Corwallis; Te-Lin Yau, and Peter T. Finden, both of Albany, all of Oreg., assignors to Teledyne Industries, Inc., Albany, Oreg.

Filed Sep. 13, 1989, Ser. No. 406,976
Int. Cl.[5] C22G *54/00*
U.S. Cl. 75—616 **1 Claim**



1. A method of reducing metal halides in a sealed reaction vessel comprising the steps of

(a) introducing a reducing metal into a reaction vessel;

(b) introducing a metal halide to be reduced into said reaction vessel;

(c) providing an inert gas atmosphere in said reaction vessel;

(d) heating the contents of said reaction vessel to a sufficient temperature for a sufficient period of time for said reducing metal to reduce said metal halide to free metal;

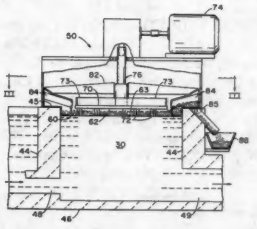
(e) maintaining said inert atmosphere in said reaction vessel isolated from the atmosphere by means of a heated liquid metal seal comprising alloys selected from the group consisting of bismuth and metals of bismuth including tin alloys.

4,983,216

ALUMINUM SCRAP MELTING

Jan H. L. Van Linden, Allison Park; Michael J. Kionosz, Apollo, both of Pa., and James R. Bowser, Maryville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 12, 1990, Ser. No. 478,455
Int. Cl.[5] C22B *21/06*
U.S. Cl. 75—672 **44 Claims**



1. A method of melting aluminum scrap and removing skim

therefrom having reduced amounts of aluminum contained therein comprising:

(a) providing a body of molten aluminum having a surface in a skim removal bay;

(b) adding melted scrap and salt to said body;

(c) collecting a layer containing salt and skim on a surface of the body in said skim removal bay, the layer containing high levels of molten aluminum in lower regions of said layer;

(d) treating the layer so that upper regions of said layer contain reduced amounts of aluminum, the treating aiding molten aluminum in the layer to return to said body; and

(e) removing a portion of the treated layer from upper regions thereof, the portion comprised of salt, skim and aluminum.

4,983,217

PROCESS TO OBTAIN ULTRA FINE MAGNETIC ND-FE-B PARTICLES OF VARIOUS SIZES

Manuel A. López Quintela; José Rivas Rey, both of Santiago de Compostela, and José Quibén Solla, Pontevedra, all of Spain, assignors to University of Santiago de Compostela, Spain

Filed Nov. 22, 1989, Ser. No. 440,890

Claims priority, application Spain, Nov. 24, 1988, 8803592

Int. Cl.[5] C22B *11/04*

U.S. Cl. 75—739 **11 Claims**

1. A process for producing ultra fine, magnetic neodymium-iron-boron particles, said process comprising the steps of:

forming a micro-emulsion, said micro-emulsion comprising a discontinuous phase and a continuous phase, said discontinuous phase containing neodymium-, iron- and boron-containing compounds, and

reacting said neodymium-, iron- and boron-containing compounds in said discontinuous phase to form said neodymium-iron-boron particles therein.

4,983,218

COMPOSITION AND METHOD FOR HARDENING AN AQUEOUS ALKALI METAL SILICATE SOLUTION

Rocco L. Mascioli, Media, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Sep. 11, 1989, Ser. No. 405,255

Int. Cl.[5] C04B *28/26*

U.S. Cl. 106—600 **23 Claims**

1. A hardener composition suitable for hardening an aqueous solution of an alkali metal silicate with reduced set time, said composition consisting essentially of

(a) from about 40 to 99 weight percent of a cyclic alkylene carbonate having from 2 to 10 carbon atoms in the alkylene radical; and

(b) from about 1 to 60 weight percent of an aliphatic alcohol having a hydroxyl number of from about 300 to 1850 meq/g KOH; wherein the amount of the aliphatic alcohol is effective to reduce the set time of the aqueous solution of alkali metal silicate as compared to the set time observed in the absence of the aliphatic alcohol.

4,983,219

TECHNIQUE FOR FORMING SILICON CARBIDE COATED POROUS FILTERS

Paul D. Tungatt, Middletown; Derek E. Tyler, Cheshire, and Harvey P. Cheskis, North Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 691,618, Jan. 14, 1985, Pat. No. 4,708,740, which is a continuation-in-part of Ser. No. 599,098, Apr. 11, 1984, Pat. No. 4,537,627. This application Mar. 23, 1987, Ser. No. 28,828

Int. Cl.[5] C09K *3/00*

U.S. Cl. 106—287.13 **3 Claims**

1. An aqueous slurry for use in preparing filtering media, said slurry having a viscosity of about 1 to about 50 centipoise and having the following composition:

from about 5% to about 20% by volume silicon carbide having a maximum settling rate of about 0.1 mm/min., from about 2% to about 50% by volume mono-aluminum phosphate, from about 0.001% to about 0.1% by volume ethylene glycol and the balance essentially water.

4,983,220

METHOD AND COMPOSITION FOR ACCELERATING THE SETTING OF CEMENTS AND REMOVING EFFLORESCENT EFFECTS

Alain Mathieu, Maisons-Laffitte, France, assignor to LaFarge Fondu International, Neuilly Sur Seine, France

Filed Feb. 3, 1989, Ser. No. 307,396

Claims priority, application France, Feb. 8, 1988, 88 01430

Int. Cl.[5] C04B *7/32, 7/02*

U.S. Cl. 106—692 **10 Claims**

1. Process for accelerating the setting of Portland cement, shortening the migration phase of the calcium ions in the liquid phase and complexing the lime released during hydration of the Portland cement, which consists in adding to the Portland cement 5–40 percent by weight of a composition consisting essentially of trihydrated alumina of natural origin and a calcium aluminates based material, the said composition being formed by vigorous joint grinding of the two constituents such that 85% of the particles have a dimension smaller than 44 u; and

wherein the proportion of trihydrated alumina in said material is between 40 and 70%, the calcium aluminates-based material has a combined Al_2O_3 content between 35 and 72% and a calcium aluminates content between 35 and 98%; and

wherein the sulfate content is no more than about 2.79%.

4,983,221

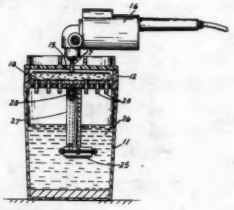
BUFFING PAD CLEANING METHOD AND APPARATUS

Richard A. Kaiser, 7083 Main St., Merton, Wis. 53056

Filed Feb. 20, 1990, Ser. No. 481,317

Int. Cl.[5] A47L *25/00*

U.S. Cl. 134—6 **14 Claims**



1. Apparatus for cleaning power driven buffing pads having a buffing face portion while the pads are mounted on a buffing machine comprising:

a. hollow enclosure means for receiving and containing a buffing pad while attached to a buffing machine and permitting rotation of the same within said enclosure means;

b. agitator means mounted within said enclosure for contacting the face of said buffing pad;

c. a reservoir for containing cleaning fluid coupled to said enclosure means;

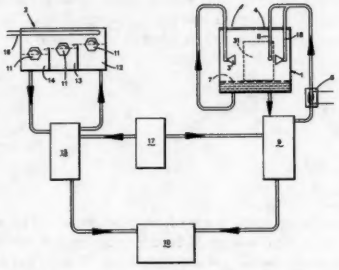
d. pump means supported within said reservoir for pumping cleaning fluid into said enclosure means and into contact with said buffing pad during rotation;

e. drive means mounted within said enclosure means positioned to co-act with said rotatable buffing pad and adapted to power said pump means under the influence of rotation of said buffing pad.

4,983,222
VAPOR SOLVENT DECONTAMINATION OF PCB TRANSFORMER COMPONENTS

Gregory R. Green, and George R. Green, both of Kirtland, Ohio, assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Apr. 14, 1988, Ser. No. 181,750
Int. Cl.[5] B08B *3/08*
U.S. Cl. 134—22.1 **5 Claims**

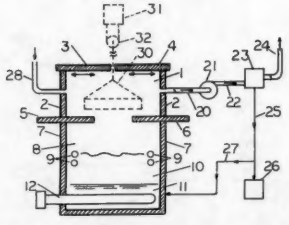


1. A method for decontamination of PCB containing transformers comprising:
   a. precleaning the transformer by vapor/degreasing using a solvent;
   b. disassembly of the transformer;
   c. mechanical removal of insulation form the transformer wire coils;
   d. final cleaning of the transformer casing by vapor/degreasing using a solvent; and
   e. final cleaning of the transformer internal components by vapor/degreasing using a solvent combined with mechanical tumbling of the transformer internal components.

4,983,223
APPARATUS AND METHOD FOR REDUCING SOLVENT VAPOR LOSSES

Adolf W. Gessner, Silver Spring, Md., assignor to Chenpatents, Silver Spring, Md.

Filed Oct. 24, 1989, Ser. No. 426,005
Int. Cl.[5] B08B *3/08*
U.S. Cl. 134—25.4 **14 Claims**

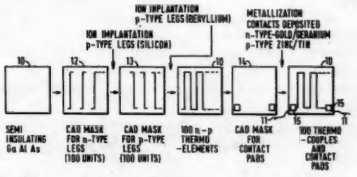


1. Improved apparatus for cleaning, degreasing and paint stripping with solvents which minimizes the emission of solvent vapor to the environment having an open-top tank for holding solvent and a vapor recovery system, wherein the improvement comprises:
   (a) an enclosure having side walls, a top opening and a bottom opening, retrofitted onto said tank;
   (b) a first pair of doors provided at the top opening for opening and sealingly closing the top opening, said doors, when closed, meeting substantially at the center of the top opening and allowing a cable carrying parts to be cleaned to sealingly pass between the doors;
   (c) a second pair of doors provided at the bottom opening for opening and sealingly closing the bottom opening, said doors, when closed, meeting substantially at the center of the bottom opening and allowing a cable carrying parts to be cleaned to sealingly pass between the doors;
   (d) means connected to one of the side walls of the enclosure for conveying a solvent vapor from within the enclosure to the solvent vapor recovery system;
   whereby solvent vapor rising from the tank during the operation or carried upward with the cleaned parts is trapped in the enclosure, removed therefrom, and recovered in a solvent vapor recovery system before the cleaned parts are removed from the enclosure via the top doors.

4,983,224
CLEANING COMPOSITIONS AND METHODS FOR REMOVING SOLDERING FLUX

Suzette L. Mombrun, Sunnyvale, and Rudolf P. Sedlak, Palo Alto, both of Calif., assignors to RD Chemical Company, Mountain View, Calif.

Filed Oct. 28, 1988, Ser. No. 263,731
Int. Cl.[5] B08B *3/08;* C23G *5/024;* C11D *3/18, 3/20*
U.S. Cl. 134—40 **6 Claims**



1. A process for removing soldering flux residue from an assembled or partially assembled electronic circuit board, which process comprises:
   contacting said board with a cleaning composition which consists essentially of 25–90% terpene/terpenol; 1–10% surfactant; and 5–65% polar aprotic solvent; said composition optionally in admixture with water, for a time period effective to mobilize and detach said flux residue; and
   removing the cleaning composition and flux residue from contact with the circuit board.

4,983,225
PROCESS OF MANUFACTURING MINIATURE THERMOELECTRIC CONVERTERS

David M. Rowe, Mid Glamorgan, United Kingdom, assignor to British Gas plc, London, England

Division of Ser. No. 209,724, Jun. 22, 1988. This application Aug. 16, 1989, Ser. No. 394,538
Claims priority, application United Kingdom, Jun. 23, 1987, 8714698
Int. Cl.[5] H01L *35/34*
U.S. Cl. 136—201 **4 Claims**

1. A method of making a thermoelectric semiconductor multicouple array which comprises the steps of forming a surface of a semi-insulating material, ion implanting a first plurality of of strips of one conductivity type through a mask onto said surface, ion implanting a second plurality of strips of the opposite conductivity type through a mask onto said surface so that said second strips are disposed alternately between said first strips and the assembly of n-type and p-type strips are electrically connected in series.

4,983,226

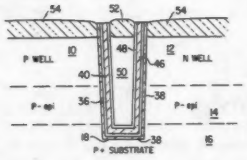
DEFECT FREE TRENCH ISOLATION DEVICES AND METHOD OF FABRICATION

William R. Hunter, Garland; Christopher Slawinski, Austin, and Clarence W. Teng, Plano, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Continuation of Ser. No. 265,306, Oct. 25, 1988, abandoned, which is a continuation of Ser. No. 110,638, Oct. 14, 1987, abandoned, which is a continuation of Ser. No. 929,253, Nov. 10, 1986, abandoned, which is a continuation of Ser. No. 701,465, Feb. 14, 1985, Pat. No. 4,631,803. This application Mar. 15, 1990, Ser. No. 494,811

Int. Cl.[5] H01L *29/30, 27/02*

U.S. Cl. 148—33.2 8 Claims



1. An isolation trench in a semiconductor body comprising:
a trench formed in the semiconductor body;
a layer of insulating material on the interior walls of said trench, said layer of insulating material being sufficiently thin to prevent stressing of the corners of said trench;
a masking layer formed adjacent said layer of insulating material;
a dialectric layer of insulating material formed adjacent said masking layer;
a second masking layer adjacent said dielectric layer; and
an isolation body filling the remaining area of said trench; and
a layer of field oxide formed over the semiconductor body and the filled trench.

4,983,227

PROCESS AND APPARATUS FOR HEAT-TREATING CARBON STEEL WIRES TO OBTAIN A FINE PEARLITIC STRUCTURE

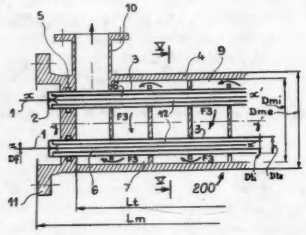
Andre Reiniche, Clermont-Ferrand, and Philippe Sauvage, Chateaugay, both of France, assignors to Compagnie Generale Des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand Cedex, France

Filed Jan. 23, 1989, Ser. No. 299,257

Claims priority, application France, Jan. 25, 1988, 88 00904

Int. Cl.[5] C21D *9/573, 9/63, 1/613*

U.S. Cl. 148—128 10 Claims



1. A method of heat-treating a wire of carbon steel so as to obtain a fine pearlitic structure, the wire having been maintained, prior to this heat-treating, at a temperature above the Ac3 transformation temperature so as to obtain a homogeneous austenite, comprising the steps of: (a) cooling the wire from a temperature greater than the Ac3 transformation temperature to a temperature less than the Ac1 transformation temperature and (b) effecting pearlitization at a temperature below the Ac1 transformation temperature, said steps (a) and (b) being carried out by passing the wire through at least one tube which contains a gas practically without forced ventilation, and which is surrounded by a heat-exchange fluid such that a transfer of heat takes place from the wire through the gas and through the tube to the heat-exchange fluid, and the characteristics of the tube, the wire and the gas being selected such that the following relations are satisfied in at least said step (a):

$$1.05 \leqq R \leqq 15 \quad (1)$$

$$5 \leqq K \leqq 10 \quad (2)$$

in which

$$R = D_{ti}/D_f$$

$$K = [Log\ (D_{ti}/D_f)] \times D_f^2/\lambda$$

D_{ti} being the inside diameter of the tube expressed in millimeters, D_f being the diameter of the wire expressed in millimeters, this diameter being not greater than 6 mm, λ being the conductivity of the gas determined at 600° C., expressed in watts.$m^{-1}.°K^{-1}$, and Log being the natural log.

4,983,228

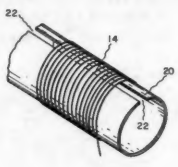
CONTRACTION PRE-ANNEALING SUPERCONDUCTING WIRE FOR LENGTH STABILIZATION FOLLOWED BY REACTION ANNEALING

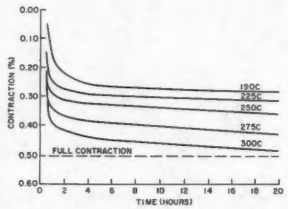
Alan I. Taub, and Mark L. Miller, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1989, Ser. No. 331,198

Int. Cl.[5] H01L *39/08, 39/24;* H01B *13/00*

U.S. Cl. 148—133 16 Claims





1. A method for making a niobium-tin wire having a substantially defined length, comprising contraction annealing the wire to cause the wire to decrease in length under conditions where the wire can decrease in length substantially unconstrained, the contraction anneal being performed without forming substantial amounts of Nb_3Sn.

4,983,229

COLD DEFORMATION PROCESS EMPLOYING IMPROVED LUBRICATION COATING

Thomas W. Tull, Royal Oak, Mich., assignor to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 683,841, Dec. 20, 1984, abandoned. This application Aug. 9, 1988, Ser. No. 240,353

Int. Cl.[5] C23C *22/83*

U.S. Cl. 148—246 25 Claims

1. A process for the cold deformation of a ferrous-base metal article comprising the steps of:

(*a*) contacting the surface of the article with a first lubricant which comprises an aqueous acidic zinc, manganese or zinc/manganese lubricating phosphate coating solution additionally containing from 0.5 to 10.0 wt. % nitrate ion and from 0.1 to 10 wt. % hydroxylamine;

(*b*) thereafter contacting the surface with a second lubricant which contains a C_8 to C_{18} fatty acid, fatty acid salt, fatty acid soap, or mixtures thereof; and

(*c*) thereafter subjecting the coated article to cold deformation.

4,983,230

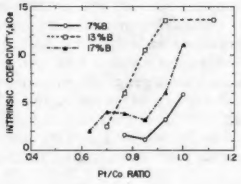
PLATINUM-COBALT ALLOY PERMANENT MAGNETS OF ENHANCED COERCIVITY

Ruel A. Overfelt, Murfreesboro, Tenn., and John A. Teubert, Huntsville, Ala., assignors to Vanderbilt University, Nashville, Tenn.

Filed Apr. 11, 1989, Ser. No. 336,041

Int. Cl.[5] H01F *1/047*

U.S. Cl. 148—300 7 Claims



1. A magnetic alloy in a structural form providing magnetic properties, said alloy being formed from platinum (Pt), cobalt (Co), and boron (B) and having the general formula PtCoB, the magnetic properties of said structural alloy having been produced by rapid solidification of a homogenous melt of said alloy to form a casting and by heat treatment of the solidified casting to improve its magnetic microstructure and increase coercivity, wherein the improvement comprises having present in said alloy from 12 to 14 atomic percent of boron together with amounts of platinum and cobalt such that the atomic ratio of platinum to cobalt (Pt/Co) is from 0.90 to 1.1.

4,983,231

COATED MAGNETIC POWDER AND A BONDED PERMANENT MAGNET COMPOSITION CONTAINING THE SAME

Hiroshi Yamanaka, and Yasuhiro Nakamura, both of Higashiosaka, Japan, assignors to Daihachi Chemical Industry Co., Ltd., Osaka, Japan

Filed May 18, 1989, Ser. No. 353,497

Claims priority, application Japan, May 25, 1988, 63-128728

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—301 11 Claims

1. A coated magnetic powder obtained by coating a magnetic powder made of an alloy that comprises a rare earth metal and iron with an agent containing alkali-modified silica particles obtained by reacting silica particles with a mean particle diameter of from 0.005 to 0.1 μm with an alkali to modify the surface portion of said silica particles by said alkali.

4,983,232

ANISOTROPIC MAGNETIC POWDER AND MAGNET THEREOF AND METHOD OF PRODUCING SAME

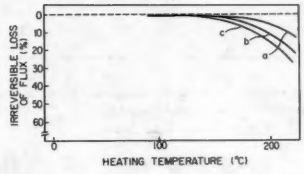
Minoru Endoh; Yasuto Nozawa; Katsunori Iwasaki, all of Kumagaya; Shigeho Tanigawa, Konosu, and Masaaki Tokunaga, Fukaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 112,875

Claims priority, application Japan, Jan. 6, 1987, 62-857; Sep. 10, 1987, 62-227388

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—302 42 Claims



1. A magnetically anisotropic magnetic powder of rare earth-iron-boron having improved thermal stability, having an average particle size of 1–1000 μm and made from a magnetically anisotropic R-TM-B-Ga alloy having an average crystal grain size of 0.01–0.5 μm, wherein R represents one or more rare earth elements including Y, TM represents Fe which may be partially substituted by Co, B represents boron and Ga represents gallium, wherein said R-TM-B-Ga alloy comprises 11–18 atomic % of R, 4–11 atomic % of B, 5 atomic % or less of Ga, and balance Fe which may be partially substituted by 30 at. % or less of Co, and inevitable impurities.

4,983,233

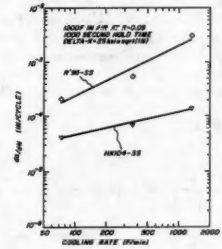
FATIGUE CRACK RESISTANT NICKEL BASE SUPERALLOYS AND PRODUCT FORMED

Michael F. Henry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,805

Int. Cl.[5] C22C *19/05*

U.S. Cl. 148—428 6 Claims



1. As a composition of matter an alloy consisting essentially of the following ingredients in the following proportions:

Ingredient	Concentration in Weight % Claimed Composition	
	From	To
Ni	balance	
Co	4	12
Cr	7	13
Mo	2	6

-continued

Ingredient	Concentration in Weight % Claimed Composition	
	From	To
Al	3.0	6.0
Ti	3.5	5.0
Ta	2.0	4.0
Nb	1.0	3.0
Re	0.0	3.0
Hf	0.0	0.75
Zr	0.00	0.10
V	0.0	3.0
C	0.0	0.20
B	0.01	0.10
W	0.0	1.0
Y	0.0	0.1

said composition having been cooled at a rate of approximately 600° F. per minute or less.

4,983,234

PHOSPHINE INHIBITION

John F. Alder, Congleton, and John J. McCallum, Clydebank, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/00997, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO89/04290, PCT Pub. Date May 18, 1989

PCT Filed Nov. 11, 1988, Ser. No. 476,364

Claims priority, application United Kingdom, Nov. 12, 1987, 8726547

Int. Cl.[5] C06G *39/00*

U.S. Cl. 149—29 **17 Claims**

1. A composition characterised by phosphorus and a minor amount of at least one radical inhibitor selected from quinonic compounds and sulphur analogues thereof, which are monofused bi-and tri-cyclic compounds bearing at least a first and a second substituent, the first and second substituents each being selected from oxo and thioxo, the second substituent being located on the same ring and ortho or para to the first substituent, other than anthraquinone or a substituted anthraquinone.

4,983,235

METHOD FOR THE PRODUCTION OF FINE-GRAINED EXPLOSIVE SUBSTANCES

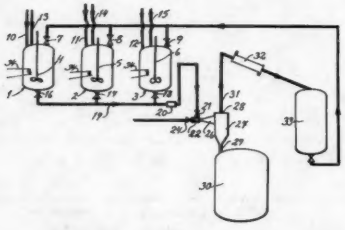
Jan-Olof Nyqvist, and Anders Hafstrand, both of Karlskoga, Sweden, assignors to Nobel Kemi AB, Sweden

Filed Apr. 28, 1989, Ser. No. 344,576

Claims priority, application Sweden, Apr. 29, 1988, 8801610

Int. Cl.[5] D03D *23/00*

U.S. Cl. 149—109.6 **12 Claims**



1. A method of producing compositions from fine-grained crystalline explosive substances, characterized in that the relevant starting components are dissolved in a vaporizable solvent capable of dissolving said components, whereafter the thus obtained solution is supplied to a steam-driven ejector with associated diffuser whose design and volumes of solvent and steam respectively supplied to the ejector are adapted so that the solvent is vaporized in the diffuser of the ejector and the crystalline components dissolved in the solvent are crystallized out and any other components dissolved in said solvent are precipitated.

4,983,236

PROCESS AND DEVICE FOR MACHINE APPLICATION OF SEALING GLANDS TO ELECTRIC LINES

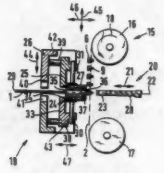
Manfred Zollner, Waltrop, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 12, 1989, Ser. No. 378,716

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823720

Int. Cl.[5] H01B *13/06*

U.S. Cl. 156—52 **22 Claims**



1. Process for machine application of sealing glands to electric lines, where the sealing gland is held in a guide sleeve during application and the line is secured by centering jaws, characterized in that the line and a sealing gland are arranged in alignment, and clamping jaws secure the line some distance behind the end of the line which is held with little play in the centering jaws, the sealing gland is positioned directly in front of the end of the line in a guide sleeve and is secured in the guide sleeve, whereupon the guide sleeve and thus the sealing gland together with the centering jaws are moved in the direction of the clamping jaws so the sealing gland is pushed onto the line.

4,983,237

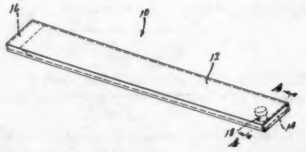
ANTENNA LAMINATION TECHNIQUE

Norman L. Alfing, Green Valley, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 18, 1988, Ser. No. 233,405

Int. Cl.[5] B41M *5/00*

U.S. Cl. 156—83 **3 Claims**



1. A process of laminating an antenna assembly comprising the steps of:

fabricating an antenna assembly having certain dimensions comprising a waveguide housing surrounding a dielectric substrate;

fabricating a fixture with a cavity having dimensions approximately the same as the dimensions of the antenna assembly;

inserting the antenna assembly into the fixture;
fastening a top plate to the fixture over said cavity containing the antenna assembly thereby confining the antenna assembly on all sides thereof;
applying sufficient heat to said fixture to cause the dielectric substrate to become tacky and to expand thereby resulting in pressure being exerted between the dielectric substrate and the waveguide housing; and
allowing the fixture to cool whereby the dielectric substrate becomes laminated to the waveguide housing.

4,983,238

METHOD FOR MANUFACTURING A THERMOPLASTIC CONTAINER WITH A LABEL

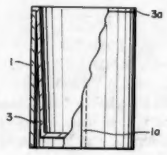
Masatsugu Yoshida, Yokohama; Seishiro Maruyama, Funabashi; Hiroshi Ezawa; Takayuki Watanabe, both of Yokohama, and Hiroaki Tsushima, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,407

Claims priority, application Japan, Oct. 22, 1987, 62-265401; Nov. 2, 1987, 62-275745; Nov. 2, 1987, 62-275746; Dec. 7, 1987, 62-307787

Int. Cl.[5] B32B *31/26*

U.S. Cl. 156—86 **23 Claims**



1. A method for manufacturing a thermoplastic container with a label comprising:
extruding a resin sheet and stretching said resin sheet in the direction of extrusion;
cutting said sheet to a desired size to make a label;
forming said label into a cylinder such that the circumference of said cylinder corresponds to the direction of stretching, said cylinder having a circumference less than the maximum circumference of the container;
placing the formed cylindrical label onto the container by applying sufficient force to stretch the portion of the label to be placed in contact with the area of maximum circumference of the container, wherein the circumference of at least a portion of the label remains less than the maximum circumference of the container; and
heating said cylindrical label to a temperature sufficient to heat shrink the label into adherence with the container.

4,983,239

METHOD OF MANUFACTURE OF TIRE USING AN ANNULAR MOLD TO FORM A MULTI-COMPONENT SUBASSEMBLY

Eric Holroyd, Knutsford, Great Britain; Colin Holroyd, Southport, United Kingdom; Anthony J. M. Sumner, Tervuren, Belgium, and Anthony R. Wright, Southport, Great Britain, assignors to Apsley Metals Limited, United Kingdom

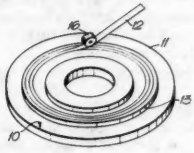
Filed Oct. 19, 1988, Ser. No. 259,721

Claims priority, application United Kingdom, Oct. 23, 1987, 8724849

Int. Cl.[5] B29D *30/06*

U.S. Cl. 156—123 **13 Claims**

1. A method of manufacture of a tire in which uncured elastomeric compound is placed into an annular mold to form a tire sub-assembly comprising at least two components selected from the group consisting of an apex, a chafer, and a sidewall, forming said at least two components to substantially a desired final shape to produce said sub-assembly and bringing the annular mold with said sub-assembly in-situ into alignment



with a toroidally shaped tire carcass to assemble said sub-assembly to the carcass.

4,983,240

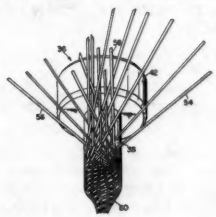
METHOD OF MAKING A FLANGED BRAIDED BEARING

Stanley S. Orkin, Vernon; Craig L. Carlson, Granby, and David B. Rowlands, Simsbury, all of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Continuation of Ser. No. 95,757, Sep. 11, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,493

Int. Cl.[5] B29C *67/12*; D04C *1/00*

U.S. Cl. 156—148 **5 Claims**



1. A method of making a flanged braided bearing having a hollow portion and a connected flange portion for guiding an associated first part for movement relative to a second part, said method comprising the steps of:
providing a mandrel having a longitudinal axis and having a cylindrical shank portion having a free end and an opposite end connected with a cylindrical shoulder portion;
arranging said cylindrical shank portion and said cylindrical shoulder portion concentrically about said mandrel longitudinal axis;
providing said cylindrical shoulder portion with a diameter broader than that of said shank portion such that said shoulder portion and said shank portion are interconnected with one another by a flat end surface extending radially outwardly and perpendicularly from said cylindrical shank portion;
weaving a plurality of strands over said mandrel to form a mandrel-bearing preform assembly by providing a plurality of axial strands and orienting each of said axial strands substantially parallel to said mandrel longitudinal axis along the outer surface of said cylindrical shank portion,
orienting portions of each of said axial strands along said flat end surface radially outwardly relative to said mandrel longitudinal axis,
providing a plurality of cross strands and weaving said cross-strands with said axial strands to form a continuous woven braid layer overlaying said cylindrical shank portion to form the portion of said bearing corresponding to said hollow portion,
continuing weaving said cross-strands with said axial strands

over said mandrel to thereby overlay said flat end surface with said woven braid layer to form the portion of said bearing corresponding to its flanged portion;

clamping said woven braid layer on said mandrel to maintain said axial strands in said orientations along said cylindrical shank portion and said flat end surface taken relative to said mandrel longitudinal axis;

impregnating said woven braid layer with a rigidifying means; and

curing said rigidifying means while applying pressure to said woven braid layer to compress said mandrel-bearing preform assembly and cure it in such a manner so that said axial strands maintain their orientations relative to said mandrel longitudinal axis along the length of said cylindrical shank portion and including along said flat end surface extending between said cylindrical shank portion and said cylindrical shoulder portion to provide increased strength in the area of said bearing where the flange portion connects with said hollow portion.

4,983,241

METHOD OF SPLICING WEBS

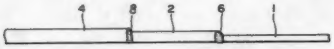
Hirokazu Sawada; Tsutomu Kakei, and Masaya Matsuki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1989, Ser. No. 301,564

Claims priority, application Japan, Jan. 28, 1988, 63-017631; Feb. 13, 1988, 63-031630; Jun. 6, 1988, 63-139164

Int. Cl.[5] B23K *31/02*; B65H *69/08*

U.S. Cl. 156—157 **5 Claims**



1. A method of splicing together first and second webs differing in shape or material from each other, wherein there is interposed between said first and second webs a dummy web having predetermined length of 200mm to 5000mm for increasing the strength of a splice between said first and second webs, and the two ends of said dummy web are respectively spliced to the respective ends of said first and second webs.

3. A method of splicing together first and second webs differing in shape from each other, comprising:

interposing between each of said first and second webs a dummy web having a predetermined length in a direction of transport for increasing the strength of a splice between said first and second webs; and

splicing the two ends of said dummy web respectively to the respective ends of said first and second webs, wherein the shapes of said first and second webs are different in web width from each other and the width of said dummy web is set intermediate between the web widths of said first and second webs.

4,983,242

TENNIS RACQUET HAVING A SANDWICH CONSTRUCTION, VIBRATION-DAMPENING FRAME

Roland Reed, 253 N. Westwind Dr., El Cajon, Calif. 92020

Filed Nov. 2, 1988, Ser. No. 267,750

Int. Cl.[5] B32B *5/00*

U.S. Cl. 156—172 **12 Claims**

1. A method of making a racket frame for tennis rackets and the like comprising the steps of:

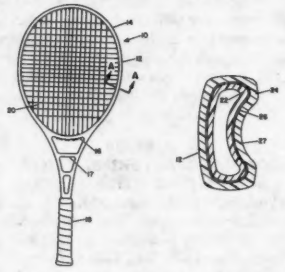
(1) providing thin, flexible sheet material of a fiber-reinforced resin and flexible sheet material of a visco-elastic material;

(2) forming an elongated inner tubular member from the fiber reinforced resin sheet material;

(3) wrapping the visco-elastic sheet material over the inner tubular member to form a dampening sleeve;

(4) wrapping fiber-reinforced resin sheet material over the dampening sleeve to form an outer tubular member therearound; steps 2–4 thereby producing a bar member having a sandwich construction; and

(5) heating and molding the bar member to cure the resin



materials, to bond the visco-elastic material to the resins, and to form a racket frame having a head portion for supporting strings and a pair of handle portions for supporting a handle.

4,983,243

METHOD OF AND APPARATUS FOR AUTOMATICALLY WINDING ADHESIVE RIBBON-LIKE MATERIAL

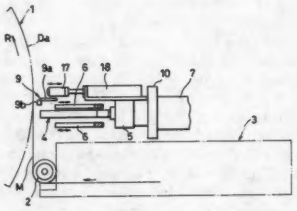
Shinzo Nakano, Isehara, and Masaru Nakajima, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,841

Claims priority, application Japan, Sep. 29, 1988, 63-242495

Int. Cl.[5] B29D *30/08, 30/14, 30/28*

U.S. Cl. 156—192 **2 Claims**



1. A method of automatically winding an adhesive ribbon-like material on an apparatus including a building drum around which a ribbon-like material is wound as the building drum is rotated in one direction, a supply unit movable forward and backward relative to the building drum for supplying the ribbon-like material to the building drum, a clamp unit opposed to the building drum and spaced from the supply unit in the direction of rotation of the building drum and comprised of a pair of left and right clamp claws with at least one of said clamp claws movable to vary a distance between said clamp claws to a width to grip both edge portions of the ribbon-like material fed from the supply unit, a pair of first pushers movably forward until pressed against the building drum and backward and spaced apart in the direction of rotation of said building drum with said left and right clamp claws interposed between the first pushers, a cutting unit spaced from the clamp unit in the direction of rotation of said building drum and having a scissors portion comprised of a fixed blade and a movable blade, said cutting unit being mounted for movement between a first position in which said scissors portion is op-

posed to said building drum and a second position where said scissors portion is withdrawn from said building drum, and a second pusher spaced from the cutting unit in the direction of rotation of the building drum and movable forward to press against the building drum and backward;

comprising the steps of:

(a) disposing the supply unit to a position close to the building drum and gripping an end portion of a ribbon-like material fed from the supply unit by the left and right clamp claws of the clamp unit;

(b) moving the first pushers in a forward direction to remove the end portion of said ribbon-like material gripped by said clamp claws and stick said end portion on said building drum while said drum is in a non-rotating state;

(c) rotating said building drum with said end portion stuck thereon to wind said ribbon-like material around said drum while pulling said ribbon-like material continuously from said supply unit;

(d) moving said supply unit backward when said ribbon-like material have been wound a required number of times around said building drum to grip an intermediate portion of said ribbon-like material extending from said supply unit to said drum by the clamp claws of said clamp unit;

(e) moving said cutting unit to said first position opposed to said building drum and cutting the ribbon-like material with the scissors portion between the clamp unit and the building drum; and

(f) moving the second pusher forward to stick a cut end portion of the ribbon-like material onto the building drum.

2. Apparatus for automatically winding an adhesive ribbon-like material comprising:

a building drum around which a ribbon-like material is to be wound as said building drum is rotated in one direction;

a supply unit for supplying the ribbon-like material, said supply unit being movably forward and backward relative to said building drum;

a clamp unit provided in a position spaced from said supply unit in the direction of rotation of said building drum and comprised of a pair of left and right clamp claws to grip both edge portions of said ribbon-like material fed from said supply unit with a gripping width substantially equal to a width of said ribbon-like material, at least one of said clamp claws is movable to vary a distance between said clamp claws;

a pair of first pushers provided adjacent said clamp unit and movable forward until pressed against said building drum and backward, said first pushers being spaced apart in the direction of rotation of said building drum with said left and right clamp claws interposed between said pair of first pushers;

a cutting unit provided in a position spaced from said clamp unit in the direction of rotation of said building drum, said cutting unit having a scissors portion comprised of a fixed blade and a movable blade and said cutting unit is movable between a first position in which said scissors portion is opposed to said building drum to cut said ribbon-like material extending between said clamp unit and said building drum and a second position where said scissors portion is withdrawn away from said building drum; and

at least one second pusher provided in a position spaced from said cutting unit in the direction of rotation of said building drum and movable forward until pressed against said building drum and backward.

4,983,244

PROCESS FOR PRODUCING GRAPHITE BLOCKS

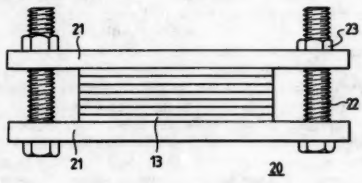
Mutsuaki Murakami, Tokyo; Susumu Yoshimura, Yokohama; Naomi Nishiki, Kyoto; Katsuyuki Nakamura, Osaka, and Kazuhiro Watanabe, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 19, 1989, Ser. No. 409,355

Claims priority, application Japan, Sep. 20, 1988, 63-235219; Sep. 20, 1988, 63-235218; Sep. 20, 1988, 63-235217

Int. Cl.[5] B29C *65/02;* **C01B** *31/02, 31/04*

U.S. Cl. 156—224 **16 Claims**



1. A process for producing a graphite block, which comprises

separately forming a plurality of 1 to 400 μm thick films of a polymer selected from the group consisting of aromatic polyimides, aromatic polyamides and polyoxadiazoles;

heat treating the films at a temperature sufficient to convert them to carbonaceous films;

superposing the plurality of carbonaceous films; and

subjecting the plurality of superposed carbonaceous films to hot pressing first at a pressure not higher than 20 kg/cm^2 and a temperature not higher than 2800° C. and then at a pressure higher than 20 kg/cm^2 and a temperature higher than 2800° C. for a time sufficient for graphitization to occur and to form a graphite block.

4,983,245

PROCESS FOR MAKING DRESSED LEATHERLIKE COMPOSITES

Philipp Schaefer, Oberstrasse 16, D-3000 Hanover, Fed. Rep. of Germany

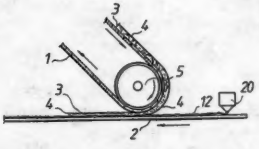
Continuation-in-part of Ser. No. 206,945, Jun. 9, 1988, abandoned, which is a continuation of Ser. No. 784,866, Oct. 4, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 339,200

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436751

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] B44C *1/165;* **B05D** *1/36;* **B32B** *27/36*

U.S. Cl. 156—231 **64 Claims**



1. A process for providing a dressing on one side of a flat, water-absorbing and water-permeable substrate having a rough surface with depressions at least on that one side to be provided with the dressing, the process comprising the steps of:

(a) heating and advancing in a transport direction a supporting base having an upper side which is textured and con-

sists of silicone caoutchouc and an underside supported on a carrier made of metal at least partially by supplying heat to the carrier;

(b) spraying a first thin-flowing cross-linkable water-containing plastics material dispersion onto the upper side of the heated supporting base in at least one operation in an amount so that at least 20 seconds after the spraying at least 10 percent by volume of the water contained in said first plastics material dispersion is evaporated;

(c) further heating the supporting base by heating the carrier so as to presolidify the first plastics material dispersion spayed onto the heated supporting base by further evaporation of water for forming on the upper side of the supporting base a first presolidified outer layer of the dressing in such a manner that the presolidified first plastics material dispersion contains only a maximum of 15 percent by volume of water while simultaneously texture is formed in situ on a lower surface of this first outer layer adjacent the textured upper side of the supporting base;

(d) applying a second water-containing, thick-flowing, highly viscous, cross-linkable plastics material dispersion having different properties than said first plastics material dispersion in an amount of between 100 and 450 g/m^2 onto the rough surface of the flat, water-absorbing and water-permeable substrate to be dressed by means of at least one rotating applicator roll, advancing the substrate in the transport direction of the supporting base on whose upper side the pre-solidified first plastics material dispersion forms the first outer layer of the dressing, and displacing the applicator roll such that relative movement exists between the applicator roll and the advancing substrate so that the second plastics material dispersion is massaged into the rough surface of the substrate;

(e) thereafter but before drying of the second plastics material dispersion, placing the flat, water-absorbing and water-permeable substrate provided with the second material dispersion onto the pre-solidified first plastics material dispersion on the upper side of the supporting base and pressing the flat, water-absorbing and water-permeable substrate onto the advancing supporting base with such a pressure that full surface contact is established between the second plastics material and the pre-solidified first plastics material dispersion disposed on the upper side of the supporting base;

(f) thereafter heating the carrier on which the supporting base is disposed to a temperature of at least 45° C. for a period of at least 15 seconds so that the water contained in the second plastics material dispersion or vapor generated from the water on heating the supporting base is first taken up by the water-absorbing and water-permeable substrate and subsequently is at least partially passed out through the substrate, and the second plastics material dispersion solidifies to form a second inner layer of the dressing, the depressions in the surface of the substrate being essentially completely filled up by the second plastics material dispersion forming said second inner layer of the dressing; and

(g) thereafter removing the substrate provided with the dressing formed of the first and second layers from the heated supporting base.

4,983,246

HOT STAMPING DECAL RESIST

William M. Bunting, Loudonville, N.Y., assignor to Mint-Pac Technologies, North Haven, Conn.

Filed Aug. 3, 1989, Ser. No. 389,008

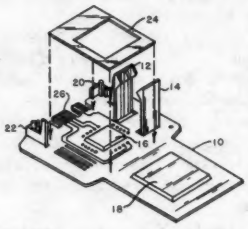
Int. Cl.^{5} H01L *21/312*; B44C *1/165*

U.S. Cl. 156—240 **5 Claims**

1. A method for applying a resist to a circuit board which comprises:

(a) forming a resist decal comprising a release sheet bearing a predetermined pattern of the dried residue of a resist which comprises between about 35 and 65 weight percent of an ester of a styrene/maleic anhydride copolymer, between about 1 and 40 weight percent of a particulate filler, an organoclay rheological additive and a solvent, said predetermined pattern being formed by screen-printing said resist on said release sheet;

(b) mating said resist decal and said circuit board; and



(c) subjecting said mated resist decal/circuit board to elevated temperature between about 93° and 260° C. and elevated pressure to hot-stamp said resist pattern onto said circuit board.

4,983,247

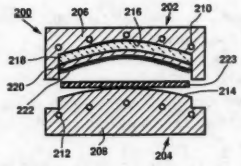
METHOD FOR PRODUCING RESIN RICH SURFACE LAYER ON COMPOSITE THERMOPLASTIC MATERIAL

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1989, Ser. No. 390,148

Int. Cl.^{5} B32B *31/00*

U.S. Cl. 156—272.2 **16 Claims**



1. A method of making a fiber reinforced composite component having a resin rich layer at a component surface comprising:

forming a fiber free layer of a first thermoplastic resin below the molten temperature of the first resin;

heating a composite bulk layer comprising a second thermoplastic resin and reinforcing fibers until the second thermoplastic resin is molten, said first and second resins comprising compatible resins; and

compressing the first resin layer and bulk layer together, said first resin layer compressed by an insulated portion of a mold, so that the heat of the bulk layer heats the fiber free layer until it is molten, while the layers are being compressed.

4,983,248

THIN-FILM COATING METHOD AND APPARATUS THEREFOR

Mitsuhiro Seki, Tokyo, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,553

Claims priority, application Japan, Dec. 16, 1987, 62-319879

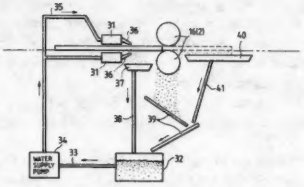
Int. Cl.^{5} B32B *31/12*

U.S. Cl. 156—497 **1 Claim**

1. A thin coating apparatus for laminating thin films to a substrate, comprising:

a pair of tack members, respectively disposed on opposite surfaces of said substrate, each tack member being bidirectionally moveable in directions perpendicular to a direction of conveyance of said substrate so as to temporarily tack respective forward end portions of said thin films thereto;

compression rollers movably disposed with respect to said substrate such that said compression rollers respectively contact said forward end portions of said thin film upon withdrawal of said tack members from said substrate, said



compression rollers being rotatable to convey said substrate and cause said respective thin films to adhere to said opposing surfaces of said substrate; and

means for depositing a void-space preventing agent in the form of mist on one of said substrate and said thin films at a position upstream of said tack members so as to prevent void surfaces from developing on contacting surfaces between said substrate and each of said thin films, said means for depositing a void-space preventing agent comprising an ultrasonic humidifier attached to a frame disposed along said direction of conveyance of said substrate.

4,983,249

METHOD FOR PRODUCING SEMICONDUCTIVE SINGLE CRYSTAL

Tsunemasa Taguchi, Suita, and Hirokuni Nanba, Osaka, both of Japan, assignors to Production Engineering Association and Sumitomo Electric Industries, Ltd., both of Osaka, Japan

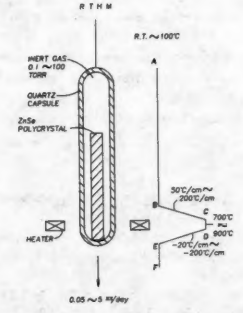
Filed Mar. 9, 1989, Ser. No. 322,200

Claims priority, application Japan, Mar. 11, 1988, 63-57687

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] C30G *1/08, 1/10, 23/02, 29/48*

U.S. Cl. 156—603 **1 Claim**



1. A method for growing a ZnSe single crystal substrate comprising the steps of:

a) placing a portion of a ZnSe polycrystal in a sealed reactor tube containing at least one gas selected from the group consisting of an inert gas, nitrogen and H_2Se and maintained at pressure of 0.1 Torr. to 100 Torr., Taguchi et al., Ser. No. 07/322,200

b) moving the reactor tube containing the ZnSe polycrystal through

i) a low temperature first zone maintained at a temperature from room temperature to 100° C./cm,

ii) a temperature-raising second zone having a temperature gradient from 50° C./cm to 200° C./cm,

iii) a high temperature third zone maintained at a temperature from 700° C. to 900° C.,

wherein the temperature of the temperature of the temperature-raising second zone does not exceed the temperature of the high temperature third zone,

iv) a temperature-lowering fourth zone having a temperature gradient from −200° C./cm to −50° C./cm and

v) a low temperature fifth zone maintained at a temperature from room temperature to 100° C. in this order at a rate of 0.05 mm/day to 5 mm/day while maintaining the solid state of the substrate wherein ZnSe polycrystal is converted to ZnSe single crystal, and

vi) cutting the ZnSe single crystal to form the ZnSe single crystal substrate.

4,983,250

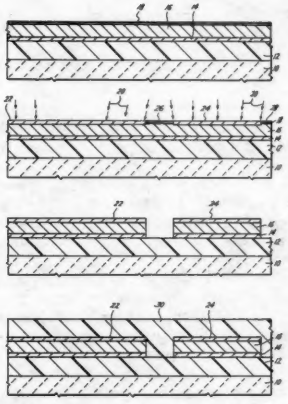
METHOD OF LASER PATTERNING AN ELECTRICAL INTERCONNECT

Ju-Don T. Pan, Austin, Tex., assignor to Microelectronics and Computer Technology, Austin, Tex.

Filed Jun. 16, 1989, Ser. No. 367,083

Int. Cl.[5] H01L *71/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—628 **19 Claims**



1. A method of forming an electrical interconnect comprising,

applying an adhesion layer over a substrate,

applying an electrical conductor layer over the adhesion layer,

applying a reacting layer over the electrical conductor layer,

directing a laser beam over the reacting layer in a desired pattern inducing the reacting layer and the conductor layer to interdiffuse and form a reaction product of the reacting and conductor layers, and

applying an etchant after the interdiffusion such that the reacting layer etches at a different rate than the reaction product, so that the desired conductor pattern can be formed.

4,983,251
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

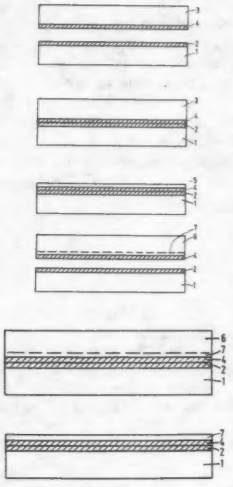
Jan Haisma; Theodorus M. Michielsen, and Jan A. Pals, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,748

Claims priority, application Netherlands, Jun. 20, 1985, 8501773

Int. Cl.[5] H01L *21/02*

U.S. Cl. 156—630 **43 Claims**



1. A method of manufacturing a semiconductor structure having at least a support body and a monocrystalline semiconductor body, said method comprising the steps of

(a) providing both said support body and said monocrystalline semiconductor body with at least one flat optically smooth surface by a bulk-reducing polishing operation,

(b) providing an electrically insulating layer on the optically smooth surface of at least said monocrystalline semiconductor body,

(c) subjecting said electrically insulating layer on at least said monocrystalline semiconductor body to a bonding-activating operation, wherein said bonding-activating operation is a light surface smoothing operation or a chemical etching operation,

(d) then contacting at least the optically smooth surface of said support body to said electrically insulating layer on said optically smooth surface of said monocrystalline semiconductor body in a dust-free atmosphere to obtain a mechanical connection,

(e) then subjecting the contacted support body and monocrystalline semiconductor body to a heat treatment of at least 350° C.,

(f) establishing a very firm bond between said support body and said monocrystalline semiconductor body, and

(g) thereafter thinning by etching said monocrystalline semiconductor body to a predetermined thickness between 0.05 and 100 microns.

32. A method of manufacturing a semiconductor structure having at least a support body and a monocrystalline semiconductor body, said method comprising the steps of

(a) forming said support body by growing a magnetic garnet layer on a first non-magnetic garnet layer,

(b) forming a magnetic domain memory or Bloch line memory,

(c) providing both said support body and said monocrystalline semiconductor body with at least one flat optically smooth surface by a bulk-reducing polishing operation,

(d) providing an electrically insulating layer on the optically smooth surface of at least said monocrystalline semiconductor body,

(e) subjecting said electrically insulating layer on at least said monocrystalline semiconductor body to a bonding-activating operation,

(f) then contacting at least the optically smooth surface of said support body to said electrically insulating layer on said optically smooth surface of said monocrystalline semiconductor body in a dust-free atmosphere to obtain a mechanical connection,

(g) then subjecting the contacted support body and monocrystalline semiconductor body to a heat treatment of at least 350° C.,

(h) establishing a very firm bond between said support body and said monocrystalline semiconductor body, and

(i) thereafter thinning by etching said monocrystalline semiconductor body to a predetermined thickness between 0.05 and 100 microns,

(j) forming semiconductor elements in said monocrystalline semiconductor body to obtain an electrical circuit for controlling said magnetic domain memory or saiud bloch line memory.

4,983,252
PROCESS FOR PRODUCING PRINTED CIRCUIT BOARD

Katsue Masui, Hyogo; Isao Kobayashi, Kanagawa; Shigeru Kubota, and Toshimoto Moriwaki, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,827

Claims priority, application Japan, Apr. 13, 1988, 65-90609; Aug. 22, 1988, 63-207716

Int. Cl.[5] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—630 **15 Claims**

1. A process for producing a printed circuit board which comprises the steps of:

depositing a positive photoresist of a vinyl polymer on a copper clad laminate thereby forming a positive resist layer;

exposing a predetermined area of the positive resist layer to actinic radiation without a photomask and removing the exposed positive resist layer, thereby forming a photoresist pattern;

etching copper from the surface of the copper clad liminate using the photoresist pattern as an etching resist thereby producing a conductor circuit pattern; and

removing the non-exposed positive resist layer.

4,983,253
MAGNETICALLY ENHANCED RIE PROCESS AND APPARATUS

John C. Wolfe; Ahmed M. El-Masry, and Fu-On Fong, all of Houston, Tex., assignors to University of Houston-University Park, Houston, Tex.

Filed May 27, 1988, Ser. No. 199,945

Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **42 Claims**

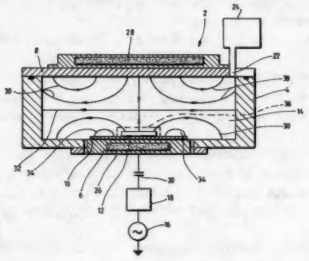
1. An etching process comprising the steps of:

supplying power between an anode and a cathode;

generating a molecular bromine plasma within a reaction chamber;

placing silicon to be etched in the vicinity of said cathode;

producing a discharge ring of a planar magnetron around the silicon; and



etching said silicon by ions attracted from said plasma toward said cathode.

4,983,254

PROCESSING FOR STRIPPING ORGANIC MATERIAL

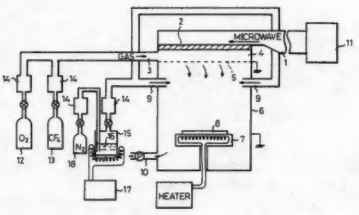
Shuzo Fujimura, Tokyo; Keisuke Shinagawa, Kawasaki, and Kenichi Hikazutani, Kuwana, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 4, 1990, Ser. No. 460,798

Claims priority, application Japan, Jan. 10, 1989, 01-3303

Int. Cl.[5] B44C *1/22;* **B29C** *37/00;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **15 Claims**



1. A process for stripping an organic material, which comprises forming gases including a gas containing oxygen and a gas containing a halogen into plasma in a plasma chamber,

supplying an active species of the halogen in said gas formed plasma to a reaction chamber to strip the organic material in said reaction chamber, wherein at least one mole of water vapor based upon two moles of the dissociated halogen atom is introduced into said reaction chamber, and

said active species of the halogen are removed before contact thereof with said organic material.

4,983,255

PROCESS FOR REMOVING METALLIC IONS FROM ITEMS MADE OF GLASS OR CERAMIC MATERIALS

Heinrich Gruenwald, Bachstr. 21, D-7431 Gomaringen, Fed. Rep. of Germany, and Hugh S. Munro, 18 Union Place, Durham DH1 3RE, Great Britain

Continuation of Ser. No. 22,805, Jan. 20, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,033

Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518197; PCT Int'l Appl., May 16, 1986, PCT/DE86/00209

Int. Cl.[5] C03C *15/00, 25/06*

U.S. Cl. 156—643 **20 Claims**

1. A process for selectively removing metal ions from the surface layer of a glass or ceramic item having metallic ions, comprising the steps of:

placing said item in a reactor;

filling said reactor with a discharge gas comprising at least one gas selected from the group consisting of hydrogen, nitrogen and noble gases;

using alternating current to create a plasma; and

applying said plasma for a sufficient time to selectively remove said metal ions.

4,983,256

METHOD FOR THE MANUFACTURE OF A PAPER PULP FOR CURRENCY USE

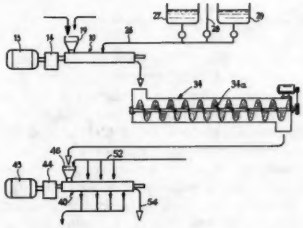
Philippe Combette, Firminy; Robert Angelier, Echirolles, and Christian Vieu, Pavillon Banque, all of France, assignors to Clextral, Firminy; Centre Technique de L'Industries des Papiers Cartons et Cellulose, Grenoble and Banque de Frane, Paris, all of, France

Filed Apr. 6, 1989, Ser. No. 333,937

Claims priority, application France, Apr. 6, 1988, 88 04548

Int. Cl.[5] D21C *3/26, 9/10;* **D21H** *27/00*

U.S. Cl. 162—18 **7 Claims**



1. Method for the manufacture of a paper pulp for currency use from stock containing textile fibers, said method comprising the successive steps of

(a) chopping said stock;

(b) boiling and bleaching said stock;

(c) chopping and boiled and bleached textile fibers;

(d) breaking and washing said textile fibers in order to separate, cut and wash said textile fibers;

(e) mixing said textile fibers in a stuff chest to obtain a first stuff or half-stuff;

(f) refining said mixed textile fibers to obtain a whole stuff;

(g) said steps (b) and (c) being performed in a continuous manner in a first treatment machine (**10**) of a type having two co-rotating screws (**10, 12**) to obtain bleached pulp;

(h) said step (d) being performed in a continuous manner in a second treatment machine (**40**) of a type having two co-rotating screws (**41, 42**) to obtain bleached and washed pulp;

(i) bleaching being completed during a retention period of 10 to 30 minutes in a retention vessel (**34**) provided with means (**34***a*) for transporting said pulp, said retention vessel being interposed between said first and second treatment machines (**10, 40**);

(j) said steps (b) and (c) taking place continuously in said first treatment machine (**10**) comprising

(i) a phase (A) of feeding and mixing of said stock with water, or recycling waters;

(ii) at least one phase (B) of compression;

(iii) at least one phase (C, E) of shearing of said textile fibers; and

(iv) at least one phase (D) of treatment by introducing boiling and bleaching reagents;

(k) said step (d) taking place continuously in said second treatment machine (**40**) comprising

(v) at lest one phase (H11, H21 . . .) of washing said pulp after bleaching by introducing washing water; and

(vi) a phase (J) of transferring and evacuating said pulp into said retention vessel (34) after bleaching and washing.

4,983,257

INVERT SIZE FOR THE INTERNAL AND SURFACE SIZING OF PAPER

Wolf-Stefan Schultz, Frankfurt, and Uwe Beyer, Dreieich, both of Fed. Rep. of Germany, assignors to Klebstofwerke Collodin Dr. Schultz & Nauth GMBH, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 87,537, Aug. 20, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 294,834

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630268

Int. Cl.[5] D21H *17/62*

U.S. Cl. 162—158 **11 Claims**

1. In an invert size for the engine and tub sizing of paper, comprising an aqueous dispersion of a fortified, hydrogenated or disproportionated and optionally esterified rosin or mixture of such rosins and of a dispersant that contains digested casein or an emulsifier of the formula

$$[R—(OCH_2CH_2)_n—O—A]^-{}_xM^{x+} \quad (I)$$

wherein R is an alkylphenyl, alkyl, or alkenyl group or a cycloalkyl group with condensed rings, A is a group of the formula $—CH_2COO$ or $—SO_3$, M^{x+} is a cation, x is 1 or 2, and n is a number such that approximately 21 to 76% of the molecular weight of the anion is in the $—OCH_2CH_2$ groups, the improvement which comprises including cationic starch in the dispersion as a dispersant, the dispersion by weight comprising about 5 to 50% of the rosin or mixture of rosins and 1 to 15% of the dispersant based on the rosin or mixture of rosins, with the remainder consisting essentially of water, the ratio of the weight of casein or emulsifier of Formula I to the weight of cationic starch in the dispersant ranging from about 20:80 to 80:20, the ratio of the weight of rosin: cationic starch ranging from about 1:0.0280 to 1:0.0710.

4,983,258

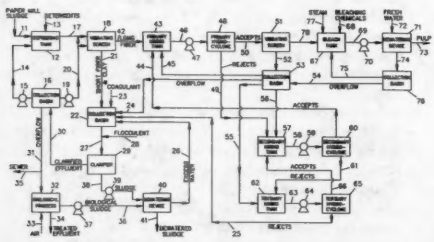
CONVERSION OF PULP AND PAPER MILL WASTE SOLIDS TO PAPERMAKING PULP

John V. Maxham, Appleton, Wis., assignor to Prime Fiber Corporation, Appleton, Wis.

Filed Oct. 3, 1988, Ser. No. 251,761

Int. Cl.[5] D21C *11/00*; D21F *1/66*

U.S. Cl. 162—189 **8 Claims**



1. A continuous process for converting waste solids including long fibers, fiber fines, clay and random debris captured by a primary clarifier or sedimentation basin at a pulp and paper mill wastewater treatment plant into a papermaking fiber or pulp that is substantially the same quality as the papermaking fiber or pulp used by the pulp and paper mill producing the waste solids the process which comprises:

a. defibering the waste solids in a slurry by mechanical means with chemicals added if necessary to assist in the release of individual fibers from fiber bundles;

b. screening the defibered waste solids on a vibrating screen or other screening device to separate the long fiber from the fiber fines and clay;

c. cleaning the long fibers of random debris using centrifugal cleaners;

d. bleaching the long fibers to increase brightness at elevated temperatures with addition of bleaching chemicals;

e. dewatering the long fibers to make it suitable for transportation;

f. separating fiber fines and clay in step 1*b* and rejected debris in step 1*c* from the water effluent using a coagulation process followed by a clarification process;

g. recycling the clarified water effluent in step 1*f* back to step 1*a;*

h. biologically treating the excess clarified water effluent in step 1*f* and discharging the treated excess water effluent from the process or recycling to step 1*e* as pulp wash water;

i. feeding the excess water effluent in step 1*c* to step 1*a;*

j. feeding the excess water effluent in step 1*d* to step 1*c;*

k. dewatering the fiber fines-clay-debris-biological sludge generated in steps 1*f* and 1*h.*

4,983,259

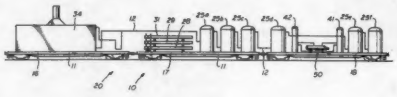
OVERLAND PETROLEUM PROCESSOR

James W. Duncan, 800 S. Gessner, Ste. 840, and Lawner L. Knox, 820 Gessner #1010, both of Houston, Tex. 77024

Filed Jan. 4, 1988, Ser. No. 140,401

Int. Cl.[5] B01D *3/14*; C10G *7/00*

U.S. Cl. 196—106 **4 Claims**



1. A petroleum processor in combination with a plurality of railroad cars, said processor comprising:

(a) a crude heater capable of burning various petroleum products, said heater providing the primary heat for fractionation separation;

(b) a modular, crude fractionation unit with means for connecting said modular fractionation unit to said heater, said fractionation unit including a plurality of fractionation vessels mounted on said railroad cars, wherein said vessels are specifically designed to meet railroad height, width and weight requirements, a control system of valving and piping with means for connecting each of said vessels disposed on a respective railroad car one to the other in series and for serially connecting the downstream vessel and the upstream vessel disposed on adjacents ones of said railroad cars so as to enable variance of the total effective number of fractionation vessels in order to effect the desired separation of a selected crude oil.

(c) said unit further comprising a plurality of heat exchangers and coolers and means for connecting said heat exchangers and coolers to said fractionation vessels to provide cooling for and heat recovery from the separated products of fractionation;

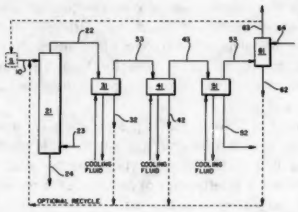
(d) computer means for operating said control system and performing simulation of a multi-component fractionation to determine the required number of said vessels to effect the desired separation; and,

(e) a utility module mounted on a separate one of said railroad cars and means for connecting said utility module to said heater, said crude fractionation unit, and said computer means to provide the necessary electrical power for operation thereof.

4,983,260
PROCESS FOR CONCENTRATING AQUEOUS ETHYLENE OXIDE SOLUTIONS

Henri Neel, 7 Boulevard Francois Ier, 76600 Le Havre, and Francis DeLannoy, 61, rue Ampére, 69310 Pierre-Benite, both of France

Continuation of Ser. No. 631,163, Jul. 16, 1984, abandoned. This application Apr. 3, 1989, Ser. No. 333,843
Claims priority, application France, Oct. 19, 1983, 83 16615
Int. Cl.[5] B01D *3/00*
U.S. Cl. 203—14 11 Claims



1. A process for the concentration of ethylene oxide present in an aqueous solution obtained by water absorption of ethylene oxide in order to separate it from a gaseous mixture produced during the catalytic oxidation in the gaseous phase of ethylene by oxygen, consisting essentially of the steps of adding said solution and steam to a distillation column so as to recover at the base of said column an aqueous stream free of ethylene oxide and at the top a gaseous stream containing ethylene oxide, progressively condensing said gaseous stream in three heat exchangers arranged in series, recovering from each exchanger a liquid phase and a gaseous stream which gaseous stream successively circulates through each of the exchangers with the absolute pressure of the distillation column and of the exchangers being between about 1.5 and 6 bars, washing only the gaseous stream recovered from the last heat exchanger in said series by an aqueous stream in an absorption column, adjusting the temperature of the cooling fluid of the first and the second heat exchangers such that the liquid phase emerging from the first exchanger does not contain over 12% of the ethylene oxide contained in the gaseous stream entering said exchangers and that the proportion of water contained in the gaseous stream leaving the second exchanger is below 5% in relation to the weight of ethylene oxide, and the temperature of the cooling fluid of the last exchanger is between about 5° C. and a maximum temperature 5° C. below the temperature of condensation of pure ethylene oxide at the pressure used, and recovering the liquid phase from the last exchanger which contains over 95% by weight of ethylene oxide.

6. A process for the concentration of ethylene oxide present in an aqueous solution obtained by water absorption of ethylene oxide in order to separate it from a gaseous mixture produced during the catalytic oxidation in the gaseous phase of ethylene by oxygen, consisting essentially of the steps of adding said solution and steam to a distillation column so as to recover at the base of said column an aqueous stream free of ethylene oxide and at the top a gaseous stream containing ethylene oxide, progressively condensing said gaseous stream in at least two heat exchangers arranged in series, recovering from each exchanger a liquid phase and a gaseous stream which gaseous stream successively circulates through each of the exchangers with the absolute pressure of the distillation column and of the exchangers being between about 1.5 and 6 bars, washing only the gaseous stream recovered from the last heat exchanger in said series by an aqueous stream in an absorption column, wherein the gaseous stream washed in the absorption column contains the ethylene oxide entering said absorption column and represents less than 5% by weight of the aqueous solution of ethylene oxide entering into the distillation column, being carried out by using two heat exchangers, adjusting the temperature of the cooling fluid of the first exchanger such that the proportion of water contained in the gaseous stream leaving said first exchanger is below 5% in relation to the weight of ethylene oxide and that said gaseous stream contains more than 50% of the ethylene oxide contained in the gaseous stream entering said first exchanger, and the temperature of the cooling fluid of the second and last exchanger being between about 5° C. and a maximum temperature 5° C. below the temperature of condensation of pure ethylene oxide at the pressure used, and recovering the liquid phase from the last exchanger which contains over 95% by weight of ethylene oxide.

4,983,261
METHOD OF APPLYING A CATALYST LAYER CONSISTING OF PRECIOUS METALS AND/OR PRECIOUS METAL COMPOUNDS TO A SUBSTRATE OF CERAMIC MATERIAL

Claus Schüler, Widen, Switzerland, and Gabriele Gerharz, Nagold, Fed. Rep. of Germany, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Dec. 22, 1989, Ser. No. 455,144
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1989, 3900571
Int. Cl.[5] C25D *5/54*
U.S. Cl. 204—30 2 Claims

1. A method of applying a catalyst layer consisting of precious metals and/or precious metal compounds to a substrate of ceramic material, wherein an electrically conducting ceramic intermediate layer is produced by firstly applying pyrolytically a tin oxide layer doped with antimony to the surface of the substrate and it subsequently being subjected to an additional heat treatment at a temperature of 700° C., the antimony thereby being incorporated into the crystal lattice of the tin oxide and the latter being firmly bonded to the substrate by sintering, and wherein the catalyst layer is applied electrolytically to the ceramic support provided in this way with an electrically conducting intermediate layer.

4,983,262
CONVERSION COMPOSITION AND PROCESS

Peter Verhoeven, 's-Hertogenbosch, Netherlands, assignor to OMI International Corporation, Warren, Mich.

Filed Feb. 16, 1990, Ser. No. 482,116
Claims priority, application United Kingdom, Feb. 27, 1989, 8904434; Sep. 27, 1989, 8921788
Int. Cl.[5] C25D *11/38*
U.S. Cl. 204—38.4 6 Claims

1. A process for preparing a black nickel deposit, the process comprising forming a nickel deposit on an article and forming a conversion layer by treating said article on which a nickel deposit has been formed in an aqueous composition containing chromate ions and nitrate ions, in which composition the article is connected as an electrode which is subjected to periodically reversed current.

4,983,263
ZINCATE TYPE ZINC ALLOY ELECTROPLATING BATH

Yoshizumi Yasuda; Nobuaki Wada; Yukio Suzuki, and Haruhisa Watai, all of Kariya, Japan, assignors to Yuken Kogyo Kabushiki Kaisha, Kariya, Japan

Filed Nov. 17, 1989, Ser. No. 437,836
Claims priority, application Japan, Nov. 21, 1988, 63-294161
Int. Cl.[5] C25D *3/56*
U.S. Cl. 204—44.2 15 Claims

1. A zincate type zinc alloy electroplating bath comprising a Zn compound, an alkali hydroxide, a salt of Fe(II, III) or Ni(II), a chelating agent for dissolving said salt of Fe(II, III) or Ni(II), and brightening agents containing alkylated polyalkylene polyamine in which some of the basic nitrogen atoms of the polyalkylene polyamine are alkylated by alkyl groups of C_1 to C_3, and at least one compound selected from the group consist-

ing of reaction products of imidazole or its derivative with epihalohydrin and reaction products of imidazole or its derivative with epihalohydrin in the presence of aliphatic amine.

4,983,264

FOUR LAYER CATION EXCHANGE FLUOROPOLYMER MEMBRANE

Haruhisa Miyake; Hiroaki Ito; Koji Suzuki, and Ryoji Yamada, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 828,606, Feb. 12, 1986, abandoned, which is a continuation of Ser. No. 733,876, May 14, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 173,041
Claims priority, application Japan, May 18, 1984, 59-98565
Int. Cl.[5] C25B *1/14*; C01J *5/20*
U.S. Cl. 204—98 **19 Claims**

1. A cation exchange fluoropolymer membrane of high mechanical strength, having integrally laminated layers, consisting essentially of:

(a) a main layer made of a perfluorocarbon polymer having carboxylic acid groups as ion exchange groups therefor with an ion exchange capacity of from 1.4 to 2.0 meq/g dry resin and having a thickness of from 50 to 250 μm;

(b) a sulfonic acid film surface layer formed on one side of said main layer, made of a perfluorocarbon polymer having sulfonic acid groups as ion exchange groups therefor with an ion exchange capacity of from 0.5 to 1.5 meq/g dry resin and having a thickness of from 5 to 50 μm;

(c) a carboxylic acid film surface layer formed on the other side of said main layer, made of a perfluorocarbon polymer having carboxylic acid groups as ion exchange groups therefor with an ion exchange capacity of from 0.5 to 1.3 meq/g dry resin and having a thickness of from 5 to 50 μm, said sulfonic acid film surface layer and carboxylic acid film surface layer constituting the outer-most layers, respectively; and

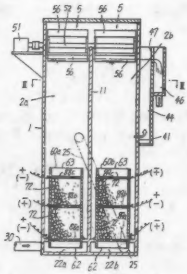
(d) a composite film layer between said main layer and said sulfonic acid film surface layer, which integrally laminates said layers, said composite film layer being made of a perfluorocarbon polymer having both carboxylic acid and sulfonic acid groups and having a thickness of from 5 to 50 μm.

4,983,265

WATER TREATING APPARATUS

Sotohiro Maruyama, 8-3, Okbocho 3-Chome, Moriguchi-shi, Osaka, Japan

PCT No. PCT/JP88/00739, § 371 Date Jun. 2, 1989, § 102(e) Date Jun. 2, 1989, PCT Pub. No. WO89/02873, PCT Pub. Date Apr. 6, 1989
PCT Filed Oct. 3, 1987, Ser. No. 368,358
Int. Cl.[5] C25B *1/18, 9/00, 11/03, 11/04*
U.S. Cl. 204—269 **12 Claims**



1. A water treating apparatus comprising:

a plurality of treating tanks having an insulated inner surface connected together in series, the most upstream treating tank having an influent opening, the most downstream treating tank having an effluent opening,

each of the treating tanks having an electrode unit at a bottom portion thereof, each electrode unit having a tubular case made of an insulating material and formed with a water inlet and a water outlet in a lower portion and an upper portion thereof, respectively,

a plurality of electrode plates, each formed with a multiplicity of holes and arranged within the case one above another at a spacing, the electrode plates defining an electrolytic chamber therebetween, wherein current is so passed that adjacent electrode plates are different in polarity, with the uppermost electrode plate in each upstream treating tank differing in polarity from the lowermost electrode plate in the downstream treating tank adjacent thereto, and

a multiplicity of soluble metal pieces, each formed with a porous hydroxide film over the surface, the metal pieces being packed in the electrolytic chamber and forming therebetween a multiplicity of clearance for passing therethrough the water to be treated.

4,983,266

CURABLE COATING COMPOSITIONS COMPRISING SELF-CROSSLINKABLE COMPONENTS

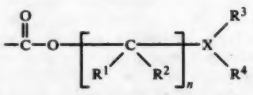
Goutam Gupta, Homewood, and Sherman J. Mels, Flossmoor, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 27, 1988, Ser. No. 290,620
Int. Cl.[5] C25D *13/06*
U.S. Cl. 204—181.7 **6 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode by passing an electrical current through an electrical circuit comprising said cathode, an anode, and an aqueous electrodepositable composition in contact with said cathode and said anode; wherein said electrodepositable composition comprises:

(a) an aqueous solvent;

(b) a self-crosslinking polymeric resin which has an average of at least two pendent hydroxy functional groups and an average of at least two pendent:



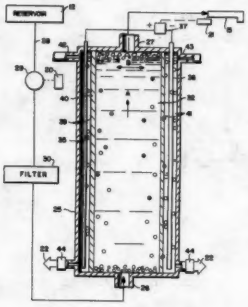
groups, wherein R^1 and R^2 are independently hydrogen, alkyl, substituted alkyl, or aryl groups; n is from about 1 to about 5; X is nitrogen, sulfur or phosphorus; and X is nitrogen or phosphorus, R^3 is hydrogen, lower alkyl, or an aryl group; R^4 is lower alkyl or an aryl group; and when X is sulfur, R^4 is nothing and R^3 is either hydrogen, methyl or ethyl; and

(c) a catalytic amount of a transesterification catalyst.

4,983,267
WATER DEIONIZATION AND CONTAMINANTS REMOVAL OR DEGRADATION

Karl Moeglich, Dunedin, and Dirk Pouli, Clearwater, both of Fla., assignors to Innova/Pure Water, Inc., Clearwater, Fla.

Filed Oct. 18, 1988, Ser. No. 259,200
Int. Cl.[5] B01D *57/02*; C25B *1/22*
U.S. Cl. 204—182.4 20 Claims



1. A method of treating an aqueous liquid having ions and contaminants therein, comprising the step of:

simultaneously dionizing, by electromigration, the liquid and removing and degrading, on particle surfaces, the contaminants therein.

4,983,268
HIGH GEL STRENGTH LOW ELECTROENDOSMOSIS AGAROSE

Francis H. Kirkpatrick, Owls Head; Kenneth Guiseley, Union; Richard Provochee, Camden, all of Me., and Samuel Nochumson, Randolph, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 3, 1989, Ser. No. 389,141
Int. Cl.[5] C07K *1/14, 3/14*; B01D *57/02*
U.S. Cl. 204—182.8 23 Claims

1. A dry solid composition capable of forming an aqueous gel useful for rapid electrophoresis, said composition consisting essentially of purified agarose characterized by a sulfate content of less than 0.2 wt % but greater than zero, a pyruvate content of 0–0.1 wt %, and a nitrogen content of 0–0.2 wt %, said gels characterized by a gel strength at 1.0 wt % concentration of at least 1200 g/cm^2, substantial absence of DNA binding in 0.7 M or less tris acetate buffer, and an electroendosmosis at 1.0 wt % concentration of 0.05 or less.

4,983,269
METHOD FOR EROSION DETECTION OF A SPUTTERING TARGET AND TARGET ARRANGEMENT

Urs Wegmann, Balzers, Liechtenstein, assignor to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Continuation-in-part of Ser. No. 106,372, Oct. 7, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 324,210
Claims priority, application Switzerland, Dec. 23, 1986, 207/86
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.13 17 Claims

1. A method for detecting a predetermined depth of erosion within a target of a sputtering source for cathode sputtering process, comprising the steps of:

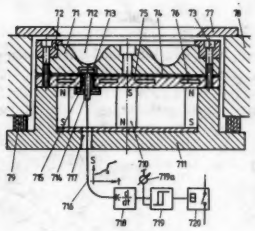
monitoring a physical value, which physical value is steadily changing as a function of depth or erosion within said target using a sensor outputting a signal representing the physical value monitored;

providing at least one material discontinuity at a predetermined depth along the path of erosion through the target, such that said physical value significantly changes when the erosion reaches said discontinuity resulting in a discontinuity of said signal; and,

detecting the occurrence of a discontinuity of the rate of change of said signal with respect to time, as an indication that erosion has reached said material discontinuity, said indication being substantially independent from steady dependency of said changing physical value with respect to erosion depth to said material discontinuity.

9. A target arrangement for detecting a predetermined depth of erosion within a target of a sputtering source for cathode sputtering process, comprising:

sensor means for monitoring a physical value, said physical value steadily changing as a function of depth or erosion



of said target, said sensor means outputting a signal corresponding to said physical value monitored;

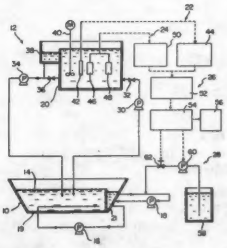
a material interface providing a discontinuity of material, said discontinuity of material generating a discontinuity in said steadily changing physical value upon said erosion reaching said material discontinuity; and

detection means connected to an output of said sensor means for detecting a discontinuity of the rate of change said output signal with respect to time corresponding to said discontinuity of said physical value upon said erosion reaching said material discontinuity, the occurrence of said discontinuity of said physical value being substantially independent from the steady change of said physical value as said erosion approaches said material interface.

4,983,270
DEVICE FOR CONTROLLING THE AMOUNT OF A SOLID PAINT COMPONENT IN ELECTRODEPOSITION COATING

Makoto Kikuta, and Hideo Terasawa, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Jan. 19, 1988, Ser. No. 145,028
Int. Cl.[5] C25D *13/22, 13/24*
U.S. Cl. 204—299 EC 4 Claims



1. A device for controlling the amount of a solid component of a paint in electrodeposition coating, said device comprising a measuring tank means,

a temperature detecting section including a temperature sensor disposed in the measuring tank means,

a section for measuring the speed of propagation of ultrasonic waves including an ultrasonic wave generator and an ultrasonic wave receiver disposed within the measuring tank means,

an operation section connected to the temperature detecting section and the speed measuring section for producing a control signal according to the temperature of the paint in the measuring tank means and the speed of propagation of ultrasonic waves, and

a supply section connected to the operation section for supplying a replenishing paint to an electrodeposition coating tank according to the control signal.

4,983,271

OXYGEN SENSOR

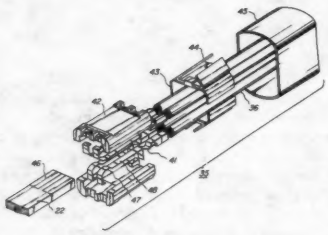
Nobuhide Kato, Ama, and Masanori Katsu, Nagoya City, both of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed May 2, 1990, Ser. No. 518,437

Claims priority, application Japan, May 15, 1989, 1-55574[U]

Int. Cl.[5] G01N *27/409*

U.S. Cl. 204—426 **2 Claims**



1. An oxygen sensor, comprising electrodes a sensor element which generates an electromotive force or which changes its electric resistance value between the electrodes depending on the oxygen concentration of the gas to be measured, electrode terminals arranged on the sensor element and connected to the electrodes, and a metallic accommodating member accommodating the sensor element, comprising; a female contact electrically connected to the electrode terminal; a ceramic housing electrically insulating the female contact from the metallic accommodating member; a resilient member pressing the ceramic housing; and a caulking ring pressing the resilient member to exhibit its resilient power; the female contact, the ceramic housing, the resilient member and the caulking ring forming a consent device receiving the electrode terminal; the caulking ring being caulked to press the resilient member such that the female contact is pressed and electrically connected to the electrode terminal by a given pressure.

4,983,272

PROCESS FOR DELAYED COKING OF COKING FEEDSTOCKS

Napoleon Stavropoulos, Fort Lee, N.J., assignor to Lummus Crest, Inc., Bloomfield, N.J.

Filed Nov. 21, 1988, Ser. No. 274,401

Int. Cl.[5] C10B *55/00*

U.S. Cl. 208—50 **11 Claims**

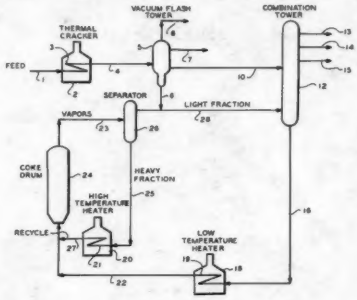
1. A delayed coking process, comprising:

introducing a coker feed to a combination tower;

fractionating said coker feed in said combination tower to provide a first cokable portion containing easily cokable components and a second cokable portion essentially free of easily cokable components;

heating said first cokable portion to a temperature below 900° F.;

heating said second cokable portion to a temperature at which a combination of said first cokable portion and said second cokable portion provides a combined feed which is at coking temperatures of from about 780° F. to about 950° F.; and



coking said combined feed at coking temperatures of from about 780° F. to about 950° F.

4,983,273

HYDROCRACKING PROCESS WITH PARTIAL LIQUID RECYCLE

Clinton R. Kennedy, West Chester, Pa.; Stuart S. Shih, Cherry Hill, N.J., and Robert A. Ware, Wyndmoor, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 5, 1989, Ser. No. 417,410

Int. Cl.[5] C10G *69/10*

U.S. Cl. 208—89 **9 Claims**

1. A hydrocracking process which comprises:

(i) hydrotreating a 650° F.+ hydrocarbon feed over a catalyst having hydrodenitrogenation and hydrodesulfurization activity,

(ii) passing the hydrotreated feed in cascade to a hydrocracking step in which the feed is hydrocracked by contacting the feed with a hydrocracking catalyst comprising zeolite beta and a hydrogenation/dehydrogenation component in the presence of hydrogen at elevated temperature and pressure to convert the feed to lower boiling products at hydrogen partial pressure from 500 to 2000 psig, a temperature from 600° to 850° F., a space velocity from 0.5 to 10 LHSV and a hydrogen:oil ratio of from 1000 to 5000 SCF/Bbl, a conversion of not more than 60 weight percent per pass to form a hydrocracked effluent and a denitrogenation of at least 90 weight percent;

(iii) fractionating the hydrocracked effluent to form a converted fraction and 650° F.+ unconverted fraction;

(iv) recycling a portion of the 650° F.+ unconverted fraction to the hydrocracking step at a recycle ratio of from 0.25:1 to 5:1 (recycle:fresh food) to effect an overall conversion of not more than 70 weight percent.

4,983,274

SHAPE SELECTIVE CRYSTALLINE SILICATE ZEOLITE CONTAINING INTERMETALLIC COMPONENT AND USE AS CATALYST IN HYDROCARBON CONVERSIONS

Nai Y. Chen, Titusville, N.J.; Thomas F. Degnan, and Paul B. Weisz, both of Yardley, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Division of Ser. No. 938,095, Dec. 4, 1986, Pat. No. 4,803,186. This application Oct. 6, 1988, Ser. No. 254,069

Int. Cl.[5] C10G *11/00*

U.S. Cl. 208—111 **20 Claims**

1. A process for effecting catalytic conversion of organic compound containing feedstock which comprises contacting said feedstock at catalytic conversion conditions with a cata-

lyst composition comprising a shape selective crystalline zeolite containing an intermetallic component, the intermetallic component comprises a hydrogenation-dehydrogenation first metal and a second metal selected from the group consisting of silicon and germanium.

4,983,275

CATALYTIC CONVERSION

John P. McWilliams, Woodbury, N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 75,496, Jul. 20, 1982, Pat. No. 4,894,212. This application Oct. 26, 1989, Ser. No. 426,837
Int. Cl.[5] C10G *47/04, 47/16*
U.S. Cl. 208—111 22 Claims

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion product comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conditions sufficient to convert said feedstock to said product with a catalyst composition comprising a crystalline silicate having the structure of ZSM-11, said crystalline silicate having been synthesized by the method which comprises preparing a mixture capable of forming said silicate, said mixture comprising a source of alkali metal cations (M), a source of silicon, octylamine (R), seed crystals of ZSM-11 structure and water, said mixture having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3 =	40–2000
H_2O/SiO_2 =	5–50
OH^-/SiO_2 =	0.05–0.5
M/SiO_2 =	0.05–0.5
R/SiO_2 =	0.03–1.0

maintaining said mixture under sufficient conditions until crystals of said silicate are formed and recovering said crystalline silicate having the structure of ZSM-11.

4,983,276

OCTANE IMPROVEMENT IN CATALYTIC CRACKING AND CRACKING CATALYST COMPOSITION THEREFOR

Robert P. L. Absil, West Deptford; Philip J. Angevine, Woodbury; Robert G. Bundens, Mullica Hill, and Joseph A. Herbst, Turnersville, all of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, and a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, and a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Jan. 29, 1990, Ser. No. 471,994
Int. Cl.[5] C10G *11/05*
U.S. Cl. 208—120 21 Claims

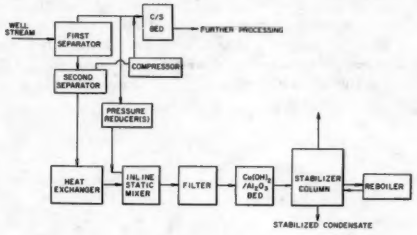
1. A catalytic cracking process which comprises catalytically cracking a hydrocarbon feed with a cracking catalyst composition comprising as a first component, a large pore crystalline molecular sieve and as a second component, a porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table I of the specification.

4,983,277

PROCESS FOR THE PRODUCTION OF NATURAL GAS CONDENSATE HAVING A REDUCED AMOUNT OF MERCURY FROM A MERCURY-CONTAINING NATURAL GAS WELLSTREAM

Costandi A. Audeh, Princeton, N.J.; Barry E. Hoffman, Duncanville, Tex., and Garry W. Kirker, Washington Township, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 27, 1989, Ser. No. 343,692
Int. Cl.[5] C01B *17/20;* C01G *13/00, 17/00*
U.S. Cl. 208—252 31 Claims



1. A process for the production of a natural gas condensate having a reduced amount of mercury from a mercury-containing natural gas wellstream comprising the steps of:

separating said wellstream into a gaseous fraction and a liquid fraction,

preheating said liquid fraction,

mixing a portion of said gaseous fraction with said preheated liquid fraction,

passing said mixture through a filter to remove mercuric sulfide,

passing said filtered mixture over a substance capable of absorbing hydrogen sulfide, and

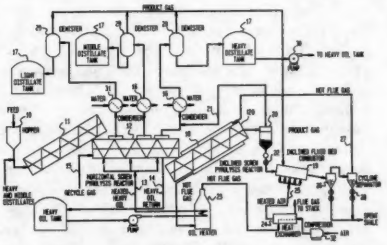
separating said mixture into a first stream comprising light hydrocarbon components and a second stream comprising a natural gas condensate.

4,983,278

PYROLYSIS METHODS WITH PRODUCT OIL RECYCLING

Chang Y. Cha, Laramie, Wyo.; Michael Duc, Abu Dhabi, United Arab Emirates, and Curtis J. Hogan, Denver, Colo., assignors to Western Research Institute & ILR Services Inc., Laramie, Wyo.

Continuation of Ser. No. 116,327, Nov. 3, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,838
Int. Cl.[5] C10G *1/00*
U.S. Cl. 208—407 19 Claims



1. A process for pyrolyzing a solid carbonaceous feed comprising:

forming a mixture of the solid feed with heavy product oil;

in a first retorting step, heating the mixture to a first temperature at substantially atmospheric pressure to form light oil, heavy oil, and solid residue;

recovering the heavy oil from the residue and recycling the heavy oil to the first retorting step;

in a second retorting step in a horizontal screw pyrolysis reactor, treating the residue at a second temperature at substantially atmospheric pressure, said second temperature being higher than said first temperature, said second retorting step completing pyrolysis of the residue and forming solid residue, product liquid and product gas; and

separating said solid residue from said product liquid and product gas and combusting said solid residue in a fluidized bed to form combusted solid residue and flue gas;

wherein the hot flue gas downstream of said heavy oil heating step is used to heat air for the combustion step.

4,983,279

PROCESS FOR THE HYDROGENATION OF LIQUID CHARGE MATERIALS WHICH CONTAIN CARBON

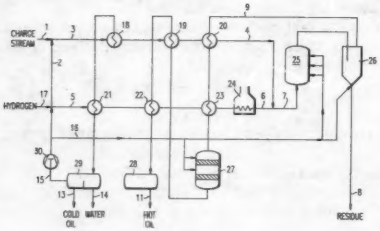
Wolfdieter Klein, Recklinghausen; Claus Strecker, Gelsenkirchen; Alfons Feuchthofen, Recklinghausen, and Ulrich Bocnisch, Muelheim am Ruhr, all of Fed. Rep. of Germany, assignors to Veba Oel Aktiengesellschaft, Gelsenkirchen, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,089

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741105

Int. Cl.[5] C10G *1/06*

U.S. Cl. 208—413 **13 Claims**



1. A process for the hydrogenation of a liquid hydrocarbon-containing charge material, comprising the steps of:

(i) supplying a high temperature, high pressure liquid phase hydrogenation reactor with two separately and indirectly heated charge streams, (a) a primary charge stream comprising a liquid hydrocarbon which can be hydrogenated and hydrogen-containing gas, and (b) a heated secondary gaseous charge stream comprising hydrogen-containing gas, and combining said indirectly heated primary charge stream and said indirectly and heated secondary charge stream prior to said liquid phase hydrogenation reactor, hydrogenating said combined streams to produce a hydrogenation product and separating the hydrogenation product in a hot separator to give a hot separator head product;

wherein said indirectly heated primary and secondary charge streams are heated by separate heat exchange means by heat exchange with said hot separator head product, and said secondary charge stream, after heating by heat exchange, is heated with a hydrogenation gas heater.

4,983,280

SCREENING APPARATUS

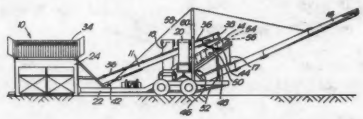
Jan E. Eriksson, Uppsala, Sweden, assignor to Powerscreen International Limited, County Tyrone, United Kingdom

Continuation of Ser. No. 196,773, May 17, 1988, abandoned, which is a continuation of Ser. No. 73,849, Jul. 14, 1987, abandoned, which is a continuation of Ser. No. 842,274, Dec. 16, 1985, abandoned. This application Apr. 5, 1989, Ser. No. 333,766

Claims priority, application United Kingdom, Feb. 15, 1984, 8403958

Int. Cl.[5] B07B *1/00, 1/46*

U.S. Cl. 209—241 **124 Claims**



1. Screening apparatus comprising an elevator having an elongated support with an endless belt arranged around two rollers longitudinally spaced apart on said support; a structure to carry said support in a plurality of inclined positions; a screen box, rectangular in plan, having a support end and a structure end, pivotally linked to the end of said support corresponding to the discharge end of said endless belt at the support end of the screen box and the screen box hinged to said structure at the structure end of the screen box, the support being capable of being extended and retracted along its length relative to said structure; and means to extend and retract the support along its length relative to said structure being provided to effect such movement whereby lengthwise movement of said support causes pivotal movement of said screen box and wherein said screen box has means to adjust its angle of inclination relative to said support with consequential movement in inclination of said support.

4,983,281

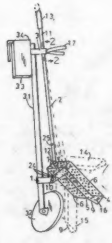
METAL DETECTOR SCOOP SIFTER

Joseph Montelione, 8531 NW. 21st Ct., Sunrise, Fla. 33322

Filed Feb. 28, 1990, Ser. No. 486,427

Int. Cl.[5] B07B *1/00*

U.S. Cl. 209—418 **9 Claims**



1. An apparatus including a sifting scoop in combination with a metal detector of the type having an elongate shaft with a detecting head at a first end and an electronic assembly at a second end, the apparatus comprising:

(a) said sifting scoop including a scoop means for scooping material, said scoop means having an open top and front and walls having perforations for passing fine materials and retaining larger material during a sifting operation;

(b) multiple-position support means for selectively supporting said scoop means in a plurality of positions, said positions including a first, scooping position in which said support means holds said scoop means extended down

below said detecting head for scooping without interference from said head, and a second, storage position in which said support means holds said scoop means alongside said shaft between said head and said electronic assembly where it will not interfere with use of said head during a metal detecting operation; and

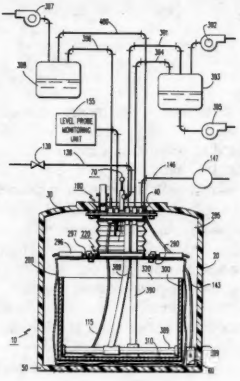
(c) attaching means for removably attaching said support means directly to said metal detector.

4,983,282

APPARATUS FOR REMOVING LIQUID FROM A COMPOSITION AND FOR STORING THE DELIQUIFIED COMPOSITION

Bryan A. Roy, Harrison; Gregory F. Boris, Sewell, both of N.J.; John J. Campbell, Prospect Park, Pa.; John G. Funk, Raleigh, N.C.; David J. Wozniak, Gloucester, N.J.; James D. Gibson, Voorhees, N.J., and Robert M. McCauley, Vincentown, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 283,408, Dec. 12, 1988, abandoned.
This application Nov. 16, 1989, Ser. No. 460,672
Int. Cl.[5] B01D *63/00*
U.S. Cl. 210—95 **33 Claims**



13. An apparatus comprising: means for dewatering aqueous slurry solids, which could contain radioactive material, including,

(a) a non-porous generally cylindrical outer container for providing primary containment for the slurry, said outer container having a first end having an opening formed therethrough and having a closed second end opposite the first end, the second end having a top surface thereon facing the first end;

means for expressing liquid from a slurry including a vertical generally annular first filter having a bottom end, said first filter disposed in said outer container for filtering the water from the slurry solids and;

a horizontal generally flat second filter extending substantially across the bottom end of said first filter for filtering the water from the slurry solids;

a non-porous collapsible membrane surrounding said first filter and said second filter for compressing the slurry solids, said membrane having an interior and having an open end having a hole, said membrane and said outer container defining a space therebetween and, a collapsible bellows having two ends, said bellows interposed between said upper fill plate and said lower fill plate, said bellows having one end thereof connected to said upper fill plate and having the other end thereof connected to said lower fillplate for providing unrestricted movement of said lower fill plate and the open end of said membrane;

(b) an upper fill plate disposed in said outer container, said upper fill plate sealingly connected to the first end of said outer container and mounted across the opening formed through the first end of said outer container for covering the opening,

(i) said upper fill plate having a first aperture therethrough for filling said membrane with the slurry solids,

(ii) said upper fill plate having a second aperture therethrough for exit of the water from said outer container,

(iii) said upper fill plate having a third aperture therethrough for exit of the water from said outer container,

(iv) said upper fill plate having a fourth aperture therethrough for exit of the water from said outer container,

(v) said upper fill plate having a fifth aperture therethrough for exit of the water from said outer container,

(vi) said upper fill plate having a first vent opening therethrough in communication with the interior of said membrane for venting the interior of said membrane, and

(vii) said upper fill plate having a second vent opening therethrough in communication with the space defined by said outer container and said membrane for venting the space defined by said outer container and said membrane;

(c) a lower fill plate disposed below said upper fill plate, said lower fill plate connected to the open end of said membrane;

(d) first dewatering means connected to said first filter for suctioning the water from said first filter; and

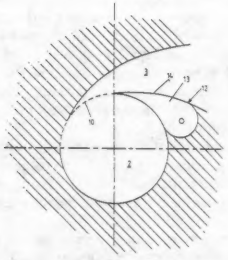
(e) second dewatering means connected to said second filter for suctioning the water from said second filter.

4,983,283

CYCLONE SEPARATOR

Mark I. Grey, South Yarra, Australia, assignor to Conoco Specialty Products Inc., Houston, Tex.

PCT No. PCT/AU87/00057, § 371 Date Oct. 21, 1988, § 102(e) Date Oct. 21, 1988, PCT Pub. No. WO87/05234, PCT Pub. Date Sep. 11, 1987
Continuation of Ser. No. 271,858, Oct. 21, 1988, abandoned.
This PCT application Feb. 27, 1987, Ser. No. 515,542
Claims priority, application Australia, Feb. 28, 1987, OG4728.75
Int. Cl.[5] B01D *19/00*
U.S. Cl. 210—104 **18 Claims**



1. A cyclone separator for multi-phase liquid mixtures for separating denser liquid components of the mixture from less dense liquid components thereof, the cyclone separator comprising an axially extending separating chamber having towards one end inlet means for admission of the mixture with a tangential flow component, wherein one of said liquid components forms droplets within the other liquid component and further wherein the distribution of such droplets is determinative of the efficiency of the separator, with the efficiency in turn being affected by variations in the cross-sectional area of the inlet means, the separating chamber having an axially positioned overflow outlet adjacent said one end, said separat-

ing chamber being generally open and unobstructed and of a generally tapered configuration with a relatively large cross-sectional size at said one end and a relatively small cross-sectional size at an axially positioned underflow outlet at the end of the separating chamber opposite said one end, wherein, in use, the denser component is directed to the underflow outlet in a fashion such as to encompass an inner axially positioned core of the less dense component which is subjected at least over a substantial part of its length to a pressure differential causing it to flow in an unobstructed axial path to said overflow outlet, the cyclone separator further including control means which comprises a flap-like member mounted for pivotal movement and disposed at or adjacent said inlet means so that pivotal movement thereof causes variation of the cross-sectional dimension of said inlet means, said separating chamber having its inner wall at the inlet end thereof defined by an unobstructed inner circumferential surface and wherein said flap like member is arranged so that it does not extend into the separation chamber beyond a projection of said inner circumferential surface through the inlet area of the separation chamber.

4,983,284

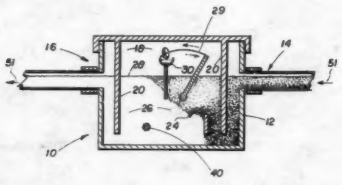
HEATED SUMP ASSEMBLY FOR A GREASE/OIL SEPARATOR

William C. Batten, Asheboro, N.C., assignor to Thermaco, inc., Asheboro, N.C.

Filed Sep. 14, 1989, Ser. No. 407,068

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—187 **9 Claims**



1. A grease/oil separator assembly designed for use in removing grease/oil contaminants from a water supply, said separator assembly comprising:

a. a separator tank including an inlet and an outlet disposed in spaced relation to one another and in fluid communicating relation with an interior of the tank and a liquid reservoir therein said liquid reservoir being constructed and arranged to have an upper liquid surface level,

b. a skimming means mounted within said separator tank and structured for skimming grease/oil contaminants from an upper level of the liquid reservoir,

c. a sump assembly disposed within said separator tank above said upper surface level to receive collected grease-/oil contaminants from said skimming means and including a contaminant receiving portion and a contaminant outlet,

d. heater means mounted within said separator tank and disposed in immersed relation within the liquid reservoir for heating the reservoir to at least a predetermined temperature,

e. heat transfer means secured in heat conducting relation to said sump assembly and disposed in heat receiving engagement within the liquid reservoir and structured for transferring heat from the liquid reservoir to said sump assembly wherein said heat transfer means comprises a heat sink structure in the form of a wing member of substantially solid, one-piece construction secured along an upper portion thereof to said contaminant receiving portion and dimensioned to extend from a connection with said sump assembly into submerged, heat receiving relation within said liquid reservoir, and

f. said heat transfer means disposed and structured to maintain the sump assembly above a predetermined temperature from heat collected from the liquid reservoir.

4,983,285

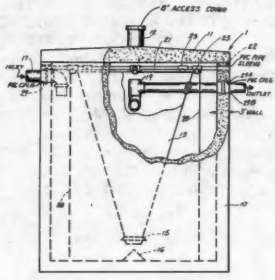
INDIVIDUAL WASTEWATER TREATMENT PLANT

H. Eugene Nolen, 400 Spalitta La., Hammond, La. 70403

Filed Jun. 4, 1986, Ser. No. 870,701

Int. Cl.[5] C02F *3/22*

U.S. Cl. 210—197 **9 Claims**



1. An individual wastewater treatment plant, comprising:

an outer tank;

an inner clarifier section suspended and supported within said outer tank; and

a support grid for said clarifier section carried and supported by said outer tank, said grid including at least three, peripheral spaced pipe portions, each having clarifier engagement means engaging the upper, peripheral portions of said inner clarifier section, said engagement means supporting and suspending said clarifier section down in said outer tank; wherein said clarifier section has a peripheral lip about its upper edge portion; and wherein said engagement means comporises a slot in the corresponding pipe portion mating with and holding said peripheral lip.

4,983,286

STERILIZING WATER-PURIFYING REAGENT FOR DRINK

Jitsuo Inagaki, 71, Aza Kamiyashiki, Itsusikicho, Hazugun, Aichi 444-04; Asao Shimanishi, 31-29-501, Toyo 5-Chome, Koto-ku, Tokyo, 135, and Taisaburo Ono, 2-23-29, Nakahara, Hiratsuka-shi, Kanagawa, 254, all of Japan

Division of Ser. No. 204,240, Jun. 9, 1988, abandoned, which is a continuation of Ser. No. 23,124, Jan. 21, 1987, abandoned. This application Oct. 10, 1989, Ser. No. 419,002

Int. Cl.[5] B07D *29/27*; C02F *1/50*

U.S. Cl. 210—257.1 **18 Claims**

1. A portable water purifier for producing drinking water comprising a water purifier body of plastic film or sheet, the

body open at the top and formed by heat sealing or high frequency wave sealing of the plastic film or sheet, and

a funnel type holder for detachably holding a filter bag connected with the inner periphery of the water purifier body,

a filter bag containing filtering material, the filter bag being supported by the funnel type holder,

a section of the body above the funnel type holder being a raw water containing chamber and a section of the body below the funnel type holder being a purified water containing chamber,

the upper portion of said raw water containing chamber being separated into two chambers including a sterilizing, precipitating and agglomerating chamber and a second chamber by switching means located at the bottom of the sterilizing, precipitating and agglomerating chamber, said switching means for opening and closing the sterilizing, precipitating and agglomerating chamber relative to the second chamber,

the sterilizing, precipitating and agglomerating chamber containing a sterilizing water-purifying reagent, and

the purified water containing chamber being generally closed and having an openable and closable outlet near the bottom of the chamber.

4,983,287

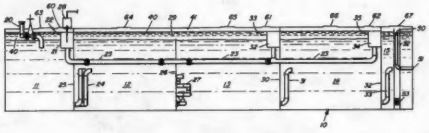
WATER TREATING USING A SERIES COALESCING FLUME

Kenneth E. Arnold, 3031 Shadowdale, Houston, Tex. 77043

Division of Ser. No. 15,293, Feb. 17, 1987, Pat. No. 4,935,154, and a continuation-in-part of Ser. No. 601,434, Apr. 18, 1984, abandoned. This application Mar. 8, 1990, Ser. No. 490,929

Int. Cl.[5] B01D *17/025*

U.S. Cl. 210—259 **3 Claims**



1. An apparatus for reducing the concentration of oil to no more than 72 milligrams of oil per liter in a mixture flowing at a predetermined rate and containing oil dispersed within a continuous water phase, comprising:

(a) a first settling compartment disposed to receive such flowing mixture;

(b) means for separating oil droplets settled out from such mixture contained within said first settling compartment;

(c) means for removing such separated oil droplets from said first settling compartment and leaving a first remaining mixture in said settling compartment;

(d) means for discharging such first remaining mixture from said first settling compartment;

(e) an enclosed conduit having an inlet, an outlet, and a flow path disposed therebetween, and having at least four flow bends, each said flow bend being configured to effect substantially a 180-degree diversion of flow therethrough, and said flow path further having a flow diameter and a flow length at least approximately 100 times longer than said flow diameter, and said enclosed conduit being disposed to receive such first remaining mixture from said first settling compartment into said inlet for flowing through said flow path and discharging such first remaining mixture from said outlet of said enclosed conduit;

(f) a second settling compartment disposed to receive fluid flowing from said outlet of said enclosed conduit;

(g) means for separating oil droplets settled out from such fluid contained within said second settling compartment;

(h) means for removing such separated oil droplets from said second settling compartment for leaving a second remaining mixture in said second settling compartment; and

(i) means for discharging such second remaining mixture from said second settling compartment.

4,983,288

FILTER ELEMENT WITH MEMBRANE-TYPE FILTER MATERIAL

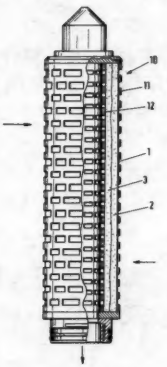
Massoud Karbachsch, Göttingen, and Manfred Pett, Wiesbaden, both of Fed. Rep. of Germany, assignors to Seitz-Filter-Werke Theo & Geo Seitz GmbH und Co., Bad Kreuznach, Fed. Rep. of Germany

Filed Jun. 2, 1989, Ser. No. 361,035

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818860

Int. Cl.[5] B01D *69/12*

U.S. Cl. 210—321.87 **17 Claims**



1. A filter element, comprising:

a support structure;

means on said support structure for guiding a flow of a fluid through said support structure from an upstream side to a downstream side;

a prefiltering membrane on said upstream side of said support structure, traversed by said fluid and forming an asymmetric pore structure with pores converging in a flow direction from said upstream side to said downstream side; and

a final filtering membrane on said downstream side of said support structure, of a chemical composition different from that of said prefiltering membrane, traversed by said fluid in said direction and formed with pores of generally uniform cross section forming a symmetric pore structure.

4,983,289

SCREEN BOWL CENTRIFUGE

Salomon M. Salomon, Brookline, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Feb. 1, 1989, Ser. No. 305,423

Int. Cl.[5] B01D *33/06*

U.S. Cl. 210—360.1 **22 Claims**

1. A solids-liquid separating centrifuge having:

a rotary bowl including a screen section,

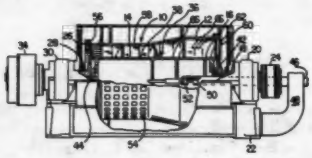
a rotary, helically-bladed conveyor mounted coaxially therein,

means for rotating said bowl and conveyor about their common axis in the same direction at a differential speed,

means for feeding a solids-liquid slurry into said bowl, and

means defining an outlet from said bowl for solids moved through said screen section by said conveyor,

said screen section comprising slotted screen means, the slots whereof communicate the interior of said screen section with the exterior of said bowl and lie substantially along



parallel helical paths which are at an angle to said common axis facing the solids discharge end of said screen section which is greater than 5°.

4,983,290

SLIT-TUBE FILTER

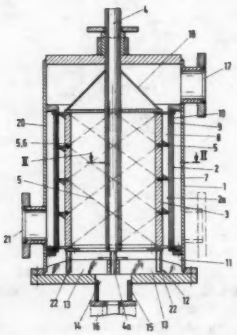
Günter Schumann, Kaarst, Fed. Rep. of Germany, assignor to Hein, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 375,385

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823192

Int. Cl.[5] B01D *24/46, 29/23, 29/64*

U.S. Cl. 210—413 6 Claims



1. A slit-tube filter comprising:

a hollow cylindrical filter element of bent wires which are attached to vertical retaining supports and form horizontal slits between them through which a liquid to be filtered passes, a cylindrical inner wall of the filter element forming an upstream filter surface with respect to a flow of liquid through said element, the liquid flowing from an inside of the filter element to an outside thereof;

a stripping device passing over the filter surface and including, bearing against the inner wall, a coaxial helix of brushes rotatable relative to the filter element in a direction such that suspended and settleable solids disposed on and ahead of the filter surface are conveyed downwardly, said helix being attached to a coaxial hollow cylinder of smaller diameter than said filter element and rotatable relative to the filter element;

a spindle attached to said hollow cylinder for rotating same; and

a clearing device attached to a bottom end of said spindle and having spirally bents arms ,said clearing device mounted in a sludge intercepting space situated below the hollow cylinder and adjoining an an underside of an annular space defined between said filter element and said hollow cylinder.

4,983,291

DRY HIGH FLUX SEMIPERMEABLE MEMBRANES

Michael M. Chau; William G. Light, and Hong C. Chu, all of San Diego, Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 14, 1989, Ser. No. 450,637

Int. Cl.[5] B01D *61/02, 71/60, 71/68*

U.S. Cl. 210—490 32 Claims

1. A high flux semipermeable membrane prepared by coating a porous support backing material with an aqueous solution of a polyamine, removing excess solution, contacting the coated porous support backing material with an organic solvent solution of a polyacyl halide, polysulfonyl halide or polyisocyanate to form a condensation reaction product within and/or on the surface of said porous support backing material, treating the resultant composite with a solution of an acid selected from the group consisting of hydroxypolycarboxylic acids, polyaminoalkylene polycarboxylic acids, sulfonic acids, amine salts of acids, amino acids, amino acid salts, polymeric acids and inorganic acids, drying and recovering the resultant high flux semipermeable membrane.

4,983,292

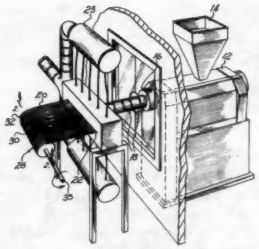
SEAMLESS FILTER BAG AND METHOD OF ITS MANUFACTURE

H. William Morgan, Jr., Filter Specialists, P.O. Box 735, Michigan City, Ind. 46360

Continuation of Ser. No. 212,140, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 139,063, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 75,207, Jul. 17, 1987, abandoned, which is a continuation of Ser. No. 881,800, Jul. 3, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 282,870

Int. Cl.[5] B01D *39/16*

U.S. Cl. 210—491 7 Claims



6. A liquid filter bag comprising a continuous seamless wall formed of overlapping liquid filtering layers of fibrous material, said wall including an integral cup-shaped, closed end; said filter layers being formed of liquid pervious micro-woven filaments.

4,983,293

SEMIPERMEABLE MEMBRANE AND PROCESS FOR PREPARING SAME

Masashi Yoshida; Katsuhisa Suzuki, and Masaaki Yoshikawa, all of Tokyo, Japan, assignors to Nikkiso Co. Ltd., Tokyo, Japan

Division of Ser. No. 358,290, May 26, 1989. This application Apr. 30, 1990, Ser. No. 516,939

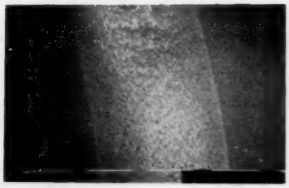
Claims priority, application Japan, May 28, 1988, 63-131013

Int. Cl.[5] B01D *13/01*

U.S. Cl. 210—500.23 7 Claims

1. A semipermeable membrane comprising a polyarylate resin and a polysulfone resin as a major membrane material,

having a water permeability of 1,500 ml/m^2.hr.mmHg or lower, as well as having an inhibitory rate against bovine



serum albumin of 80% or higher and against cytochrome C of 40% or lower.

4,983,294

SEPARATOR

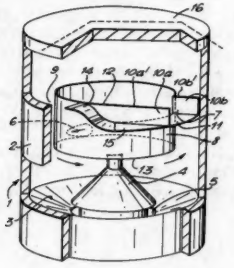
Timothy J. Lamb, Clevedon, United Kingdom, assignor to Hydro International Limited, United Kingdom

Filed Oct. 6, 1989, Ser. No. 418,152

Claims priority, application United Kingdom, Oct. 7, 1988, 8823631

Int. Cl.^{5} B01D *17/25*

U.S. Cl. 210—521 **12 Claims**



1. A separator for operation at low energy for separating solid components out of a liquid mixture, comprising a vessel having a cylindrical outer wall and a base at one end, the vessel being provided with (a) a body which defines with the base an annular opening which is spaced from the outer wall (b) an inlet, for introducing a liquid containing the solid components into the vessel, (c) means for promoting a rotational movement of liquid and suspended solids within the vessel, and (d) an outlet duct by which the liquid from which solids have been separated is removed from a central region of the vessel, wherein said outlet duct is positioned at an upper region of the vessel across the normal, direct annular path of circulating liquid in the vessel, wherein a flow modifying means is provided adjacent the outlet duct whereby circulating liquid in the vessel is caused to flow around said duct, away from its normal annular path, in a manner to reduce turbulence, and wherein said rotational movement promoted within the vessel is sufficient to cause or enhance an inward sweeping effect toward the annular opening on solids accumulated at the base of the vessel, whilst being of a sufficiently low energy that separation of the solids components in the liquid in the vessel is brought about primarily by gravity.

4,983,295

SEPARATOR

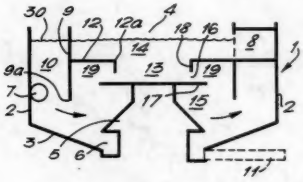
Timothy J. Lamb, and Robert P. M. Smisson, both of Clevedon, Great Britain, assignors to Hydro International Limited, United Kingdom

Filed Oct. 6, 1989, Ser. No. 418,150

Claims priority, application United Kingdom, Oct. 7, 1988, 8823632

Int. Cl.^{5} B01P *17/025*

U.S. Cl. 210—521 **10 Claims**



1. A low energy separator for separating solid components out of a liquid mixture, comprising (a) a vessel having a cylindrical outer wall and a base at one end, (b) a body which is provided within the vessel and which defines with the base an annular opening spaced from the outer wall, (c) an inlet for introducing the liquid mixture into the vessel, (d) an outlet in the upper region of the vessel for removing from the vessel liquid from which solid components have been separated, (e) a primary annular dip plate in an upper region of the vessel and spaced from the outer wall of the vessel and (f) means for promoting a rotational movement of liquid and suspended solids within the vessel, said rotational movement being sufficient to cause or enhance an inward sweeping effect towards the annular opening on solids accumulated at the base of the vessel, whilst being of sufficiently low energy that separation of the solids components of the liquid in the vessel is brought about primarily by gravity; wherein the separator also includes a floatables trap defined in the upper region of the vessel, inward of the primary dip plate, the floatables trap being defined by a wall or walls which terminate below the level of the outlet whereby any flow path from the floatables trap to the outlet must first be downward to clear the wall or walls of the trap and then upward to reach the outlet.

4,983,296

PARTIAL OXIDATION OF SEWAGE SLUDGE

Matthew A. McMahon; Robert M. Suggitt, both of Wappingers Falls; Ronald J. McKeon, Beacon, and Albert Brent, Floral Park, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 3, 1989, Ser. No. 389,435

Int. Cl.^{5} C02F *11/06*; C10J *3/46*

U.S. Cl. 210—603 **41 Claims**

1. A process for the partial oxidation of sewage sludge the improvement:

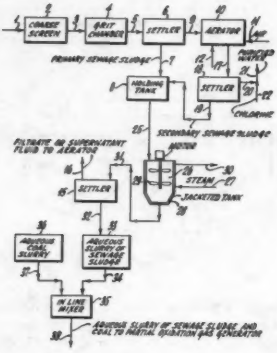
(1) heating a concentrated aqueous slurry of sewage sludge obtained from sewage and comprising combustible and non-combustible materials and having a solids content of at least 3 wt. % in the absence of air at a temperature in the range of about 200° to 600° F. and at a pressure at or above the vapor pressure of water at said elevated temperature until a large portion of the organic matter in said sewage is agglomerated;

(2) dewatering the heated aqueous pumpable slurry of sewage sludge from (1) to a solids content in the range of about 25 to 50 wt. %;

(3) mixing the pumpable aqueous slurry of sewage sludge produced in (2) having a higher heating value (HHV) of at least 3,000 Btu/lb (dry basis) with a supplemental solid fuel comprising particles of coal and/or petroleum coke having a higher heating value (HHV) of at least about

8,000 Btu/lb (dry basis) to produce a pumpable aqueous sewage sludge-coal and/or petroleum coke slurry having a solids content in the range of about 30 to 65 wt. %, and having a higher heating value (HHV) of at least about 6,000 Btu/lb (dry basis); and

(4) reacting said pumpable aqueous sewage sludge-coal



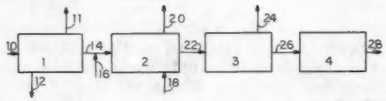
and/or petroleum coke slurry from (3) in the reaction zone of a partial oxidation gas generator at a temperature in the range of about 1800° F. to 2800° F. and a pressure in the range of about 1–35 atmospheres, and in the presence of a free-oxygen containing gas, thereby producing a hot raw effluent stream of synthesis gas, reducing gas or fuel gas.

4,983,297

WASTE WATER TREATING PROCESS SCHEME

Stanislaus A. Kaczmarek, Morris Plains; Piyush S. Shah, Succasunna, and George A. Green, Elizabeth, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 29, 1988, Ser. No. 290,381
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—605 **10 Claims**



1. A process for treating waste water derived by separating water from crude oil at a crude oil production well, said waste water comprising insoluble oil, solids, organic pollutants, hydrogen sulfide, and alkali metal component in an amount of at least about 700 mg/l, calculated as elemental metal, and a Group IIA metal component of the Periodic Table of the Elements, which comprises the steps of:

(a) removing at least a portion of said oil and solids from said waste water to produce a deparliculated waste water;

(b) removing at least a portion of said hydrogen sulfide from said waste water resulting from step (a);

(c) subjecting the waste water resulting from step (b) to an anaerobic biological treatment to convert at least a portion of said organic pollutants to carbon dioxide and methane, wherein said waste water is contacted with an acclimated biomass of anaerobic microorganisms, said biomass being acclimated by the steps of: (i) contacting a biomass of anaerobic microorganisms, in the absence of molecular oxygen, with a water stream comprising organic pollutants, a Group IIA metal component of the Periodic Table of Elements and an alkali metal component; and (ii) incrementally adding an additional amount of said alkali metal component to said water of step (i) to acclimate said biomass of step (i); and

(d) subjecting the waste water resulting from step (c) to an aerobic biological treatment to decrease the biological oxygen demand of said waste water.

4,983,298

PROCESS FOR THE DISINFECTION AND AEROBIC STABILIZATION OF SEWAGE SLUDGE

Leonhard Fuchs, and Martin Fuchs, both of Im Stocktal 2, D-5440 Mayen 1, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 483,045
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905228; Aug. 31, 1989, 3928846
Int. Cl.[5] C02F *11/06*
U.S. Cl. 210—613 **11 Claims**

1. A process for the disinfection and aerobic stabilization of concentrated sewage sludge in several steps employing one or more heat-insulated containers and addition of an oxygen-containing gas, said process comprising:

(a) providing entering sludge concentrated to at least 2% of dry matter, causing the sludge to reach a thermophilic temperature range about 50° C. in about 2 to 4 days, and maintaining the thermophilic temperature range solely by aerobic degradation and without supplying external heat;

(b) disinfecting the sludge by further aerobic degradation without supplying external heat either at about 50° C. to 55° C. for at least 20 hours, or above 55° C. for at least 10hours; and

(c) stabilizing the sludge at mesophilic temperature with active cooling to about 25° C. to 45° C., and allowing further aerobic degradation for about 2 to 8 days.

4,983,299

REMOVAL OF PHENOLS FROM WASTE WATER BY A FIXED BED REACTOR

F. S. Lupton, Evanston, and Denise M. Zupancic, Bensenville, both of Ill., assignors to Allied-Signal, Morris Township, Morris County, N.J.

Filed Apr. 10, 1989, Ser. No. 335,610
Int. Cl.[5] C02F *3/10*
U.S. Cl. 210—617 **20 Claims**

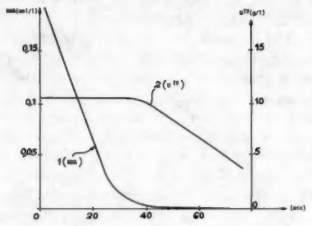
1. A method for the aerobic biodegradation of phenolic materials in aqueous streams to levels under about 0.1 parts per million in a period no more than about 30 hours comprising flowing at a rate corresponding to an hydraulic residence time no more than about 30 hours an aqueous stream containing phenolic materials in the presence of oxygen through a fixed mass of a porous biomass support system of particulate open-celled polyurethane foam having entrapped within its pores powdered activated carbon and aerobic phenolic-degrading microorganisms.

4,983,300

PROCESS FOR THE REEXTRACTION IN AQUEOUS SOLUTION OF THE PLUTONIUM PRESENT IN AN ORGANIC SOLVENT, MORE PARTICULARLY USABLE FOR SPLITTING URANIUM AND PLUTONIUM

Michel Germain, Marcoussis; Bruno Gillet, Meudon la Foret, and Jean-Yves Pasquiou, Gif sur Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 16, 1988, Ser. No. 285,768
Claims priority, application France, Dec. 18, 1987, 87 17726
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 14 Claims



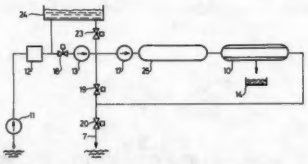
1. Process for recovering plutonium present in an organic solvent which comprises contacting the organic solvent with an aqueous nitric acid solution of a uranous salt and a hydroxylamine salt.

4,983,301

METHOD AND APPARATUS FOR TREATING FLUIDS CONTAINING FOREIGN MATERIALS BY MEMBRANE FILTER EQUIPMENT

László Szücz, Koszta József u.43., and Attila Szücs, Liptó u.8., both of Budapest, Hungary (H-1124)

Filed Sep. 15, 1988, Ser. No. 274,144
Claims priority, application Hungary, Mar. 6, 1987, 955/87; Apr. 7, 1987, 955/87; Nov. 10, 1987, 955/87
Int. Cl.[5] B01D *61/06*
U.S. Cl. 210—636 24 Claims



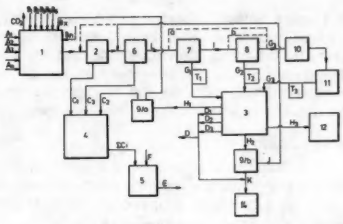
1. In a method for treating fluids containing foreign materials by membrane filter equipment, comprising the steps of supplying a fluid to be treated to an inlet of the membrane filter equipment, producing in said equipment a concentrate containing more foreign material than the fluid supplied to said inlet and a permeate containing less foreign material than the fluid supplied to said inlet, circulating the fluid in a fluid circuit through said equipment under a predetermined pressure by recycling at least a part of the concentrate leaving the equipment to said inlet and repeating said circulation step with fresh fluid to be treated; the improvement in which the concentrate leaving the equipment is recycled to said inlet alternately through a first branch and a second branch during alternate circulation periods, each of said branches comprising a fluid storing device.

4,983,302

COMPLEX PREPARATION-PROCESS FOR DECREASING THE NON-RADIOACTIVE SALT CONTENT OF WASTE SOLUTIONS OF NUCLEAR POWER STATIONS

Tibor Bálint; Tamás Drozda; Gyula Mózes; Mihály Kristóf; Éva Hanel, all of Veszprem, and Péter Tilky, Paks, all of Hungary, assignors to Magyar Asvanyolaj es Földgaz Kiserleti Intezet, Veszprèm, Hungary

Filed Mar. 25, 1986, Ser. No. 843,741
Int. Cl.[5] C02F *9/00*
U.S. Cl. 210—638 8 Claims



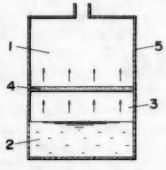
1. A complex separation process for treating liquid waste of intermediate radioactivity level from a nuclear power plant to decrease the non-radioactive content of said liquid waste, said liquid waste containing (a) non-radioactive materials comprising at least alkali metal nitrates and boric acid, and (b) radioactive material; comprising separating said liquid into a first, primarily radioactive stream, and a second, primarily non-radioactive stream, said first stream comprising at least 99% of the radioactive material contained in said liquid waste, excepting tritium, and less than half of the non-radioactive material contained in said liquid waste material, said second stream containing the balance of said non-radioactive material and then concentrating said first stream for safe storage, whereby the total mass of solid material contained in said liquid waste that is produced is significantly reduced for safe storage.

4,983,303

METHOD OF SEPARATING A PARTICULAR COMPONENT FROM ITS LIQUID SOLUTION

Tadashi Uragami, Mino, Japan, assignor to Lignyte Co., Ltd., Osaka, Japan

Filed Dec. 9, 1987, Ser. No. 130,504
Claims priority, application Japan, Dec. 25, 1986, 61-309991
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 7 Claims



1. A method for separating a liquid component from a solution containing two or more liquid components, which comprises:

(a) providing a vessel divided by a permeable membrane into a solution chamber and a vacuum chamber, said membrane being selectively permeable to the vapors of the component to be separated;

(b) placing the solution into the solution chamber out of direct contact with the permeable membrane;

(c) applying a vacuum to the vacuum chamber to evaporate the solution in the solution chamber and draw the resulting vapors through the permeable membrane into the vacuum chamber, whereby the component to be separated selectively permeates through the membrane in a vapor-to-vapor phase environment.

4,983,304

MEMBRANE FOR SEPARATION OF WATER-ALCOHOL MIXED LIQUID AND PROCESS FOR PREPARATION THEREOF

Takashi Tsugita; Shinya Takeuchi, both of Marugame; Koichi Doi, Tokyo, and Fumito Kishimoto, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi and Katokichi Co., Ltd., Kagawa, both of, Japan

Filed Nov. 16, 1989, Ser. No. 437,176

Claims priority, application Japan, Nov. 16, 1988, 63-289195

Int. Cl.[5] B01D *71/08*

U.S. Cl. 210—640 **13 Claims**

1. A membrane for the separation of a water-alcohol mixed liquid by the pervaporation method, which is composed of a chitosan having a molecular weight of 80,000 to 150,000 and a deacetylation degree adjusted to 80 to 95%.

6. A process for the separation of a water-alcohol mixed liquid, wherein the separation is carried out by using a separating membrane as set forth in claim 1 by the pervaporation method.

4,983,305

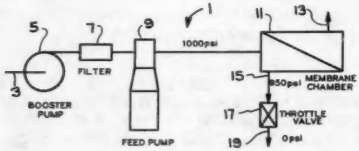
POWER RECOVERY PUMP TURBINE

Robert A. Oklejas, 774 E. Hurd Rd., and Eli Oklejas, Jr., 1648 W. Lorain, Apt. 202, both of, Monroe, Mich. 48161

Division of Ser. No. 315,139, Feb. 24, 1989. This application Nov. 15, 1989, Ser. No. 437,449

Int. Cl.[5] B01D *61/06, 61/18*

U.S. Cl. 210—642 **19 Claims**



1. A reverse osmosis water purification system comprising:

a feed pump supply high pressure water to be purified;

a first purification membrane chamber having an inlet for receiving said high pressure water from said feed pump, an outlet for water purified in said first membrane and a discharge opening for the high pressure reject of unpurified water discharged from said first membrane chamber;

means for recovering energy from at least one purification membrane chamber for application in at least another purification membrane chamber including a power recovery pump turbine positioned adjacent said first membrane chamber, said power recovery pump turbine having a turbine end and a pump end, an impeller positioned turbine and pump ends of said power recovery pump turbine, said turbine impeller and said pump impeller being mounted on a common shaft, said turbine end having an inlet opening for receiving said high pressure reject from said first membrane, said high pressure reject causing said turbine impeller to rotate, said pump impeller mounted on said common shaft being caused to rotate by said rotation of said turbine impeller, said pump end having an inlet opening for receiving said purified water from said first membrane chamber and a discharge opening, the pressure of said purified water being increased by the rotation of said pump impeller so that the purified water discharged from said pump end of said power recover pump turbine is at an elevated pressure sufficient to allow a purification membrane chamber to further purify said water, and

a second purification membrane chamber having an inlet for receiving said water from said discharge opening of said pump end of said power recovery pump turbine, an outlet for water further purified in said second membrane chamber and a discharge opening for the reject of unpurified water discharge from said second membrane chamber, said pump end of said power recovery pump turbine increasing the pressure of said water discharged from said outlet of said first membrane to allow said water to be purified in said second membrane.

19. A method for purifying saltwater comprising:

supplying high pressure saltwater to a plurality of membrane chambers positioned in series, said membrane chambers having an inlet for said high pressure saltwater, an outlet for purified water and a discharge opening for unpurified reject water discharged from said membrane chamber;

recovering energy from at least one purification membrane chamber for application in at least another purification membrane chamber including directing said high pressure reject water from said last membrane chamber in said series to the turbine side of a power recovery pump turbine, said power recovery pump turbine having a turbine side and a pump side, said pump side having a plurality of pumping chambers, there being one less pumping chamber than the number of membrane chambers in said series, an impeller being positioned in said turbine side and in each pumping chamber on said pump side, said impellers being mounted on a common freely rotatable shaft;

causing said turbine and pump impellers to rotate due to the passing of said high pressure reject water through said turbine side of said power recovery pump turbine;

directing said high pressure reject water from said other membrane chamber in said series to one of said pump chambers on said pump end of said power recovery pump turbine;

increasing said pressure of said high pressure reject water by the rotation of said impellers in said pump chambers on said pump end of said power recovery pump turbine;

supplying said unpurified reject water from said pump chambers to said next membrane chamber in said series to purify a portion of said water, said unpurified portion of said water being discharged from said discharge opening of said membrane chamber.

4,983,306

METHOD OF TREATING WASTE WATER

J. Paul Deininger, and Linda K. Chatfield, both of Colorado Springs, Colo., assignors to The Regents of the University of California, Los Alamos, N. Mex.

Filed May 9, 1989, Ser. No. 349,285

Int. Cl.[5] C02F *1/52*

U.S. Cl. 210—724 **14 Claims**

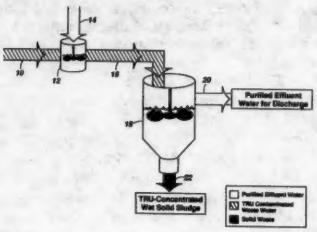
1. A process of treating water to reduce the concentration of the transuranic elements contained therein comprising:

a. adjusting the pH of a transuranic element-containing water source to within the range of about 6.5 to about 14.0;

b. admixing said water source with an alkali or alkaline earth ferrate in an amount sufficient to form a precipitate within said water source, said amount of ferrate effective to reduce the transuranic element concentration in said water source;

c. allowing the precipitate in said admixture to separate and

thereby yield a supernatant liquid having a reduced transuranic element concentration; and



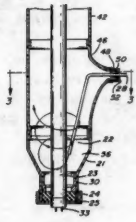
d. separating said supernatant liquid having the reduced transuranic element concentration from the admixture.

4,983,307

METHOD FOR STERILIZING LIQUIDS BY ULTRAVIOLET RADIATION

Samuel A. Nesathurai, St. Clet, Canada, assignor to Serres Naturtek Greenhouses Inc., Les Cedres, Quebec, Canada

Filed Aug. 2, 1989, Ser. No. 388,502
Int. Cl.[5] C02F *1/32*
U.S. Cl. 210—748 **1 Claim**



1. A process for reducing the dissemination of aquatic organisms and decreasing the risk of diseases caused by fungi of *Pythium* and *Phythophthora* spp in greenhouse plants grown hydroponically by Nutrient Film Technique (NFT), consisting essentially of treating the water to be used in the NFT with ultraviolet radiation at a wavelength of 2537Å by passing the water in a zone of laminar flow in contact with and exposed to the surface of an ultraviolet radiation source and maintaining the water in the range of 18° to 23° C. as it is passed in the zone.

4,983,308

AUTOMATIC CHEMICAL CLEANING OF GRANULAR MEDIUM FILTERS

Ronald L. Edwards, Wausau, Wis., assignor to Zimpro/Passavant Inc., Rothschild, Wis.

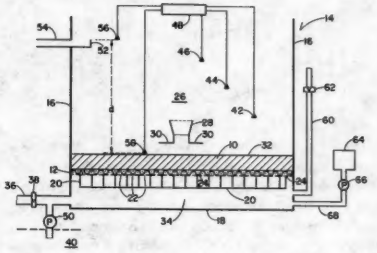
Filed Dec. 18, 1989, Ser. No. 452,454
Int. Cl.[5] B01D *24/46*
U.S. Cl. 210—794 **5 Claims**

1. A process for automatically initiating a chemical cleaning cycle for a granular medium bed filter with upper and lower bed surfaces, said granular medium bed supported above an underdrain cavity, comprising the steps;

(a) filtering a liquid through said granular medium bed by introducing liquid above said bed for down-flow passage to said underdrain cavity to produce a filtrate, and further introducing liquid above said bed to raise the level of liquid above said bed to a backwash cycle initiating level;

(b) backwashing said granular medium bed whereby said filtrate flows upwardly through said bed and out of said filter through a backwash outlet therein;

(c) selecting a predetermined time interval required for the level of liquid above said filter bed to drain from said backwash outlet level to said upper bed surface level following a backwash cycle;



(d) measuring by measuring means the time interval required for the level of liquid above said filter bed to drain from said backwash outlet level to said upper bed surface level following a backwash cycle; and

(e) initiating a chemical cleaning cycle for said filter upon said measured time interval of step (d) exceeding said predetermined time interval of step (c).

4,983,309

LUBRICANTS FOR COTTON SPINNING

Tsukasa Kinoshita, and Tomohiro Kato, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 103,517, Oct. 1, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 334,796
Claims priority, application Japan, Oct. 3, 1986, 61-236550
Int. Cl.[5] D02G *3/00*
U.S. Cl. 252—8.6 **12 Claims**

1. A pre-treatment method in cotton spinning consisting of the step of applying a treatment agent to raw cotton during a bale opening or beating opener process of said raw cotton at 0.001–2.0 wt% by silicone component thereof, said treatment agent being an aqueous emulsion which contains as solid component

silicone with viscosity at 25° C. of 10cst or greater selected from the group consisting of dimethylsilicone, end hydroxy modified dimethylsilicone and epoxy modified dimethylsilicone, and

an emulsifier selected from the group consisting of polyoxyethylene alkylether and polyoxyethylene alkylphenylether, said emulsifier being 15 wt % or less with respect to said solid component.

4,983,310

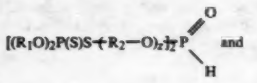
MULTIFUNCTIONAL LUBRICANTS AND MULTIFUNCTIONAL ADDITIVES FOR LUBRICANTS

Linda A. Benjamin, Horsham, Pa.; Andrew G. Horodysky, Cherry Hill, N.J.; Derek A. Law, Yardley, and Shi-Ming Wu, Newtown, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

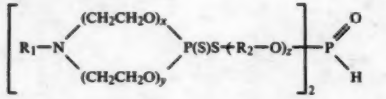
Filed Dec. 30, 1988, Ser. No. 292,080
Int. Cl.[5] C10M *105/72, 105/74*
U.S. Cl. 252—32.7 E **18 Claims**

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor multifunctional extreme pressure, antiwear, antioxidant and friction reducing amount of a reaction product of a polymeric olefin or functionalized olefin and an alkoxylated dihydrocarbyl dithiophosphoric acid de-

rived phosphite wherein said phosphite reactant is selected from phosphites having the following structures:


(I)

and


(II)

where R_1 is C_1 to about C_{30} hydrocarbyl or where R_1 is C_1 to about C_{30} hydrocarbyl containing oxygen, sulfur, or nitrogen moieties and R_2 is a divalent hydrocarbylene group containing from 2 to about 30 carbon atoms, x and y each independently equal from 1 to about 50, and z is from 1 to about 10 and wherein the molar ratio of phosphite to olefin varies from about 1:1 to about 1:3, the reaction temperature varies from about 80 to about 225° C., the pressure varies from ambient or atmospheric to slightly higher than atmospheric pressure and the reaction time varies from about 1 to about 10 hours or more.

4,983,311

MAGNETIC COATING AND MAGNETIC RECORDING MEDIUM

Eitaro Nakamura, Tokyo; Masahiro Yamakawa, Kawasaki; Akira Nakayama, Yokosuka, and Fumio Takano, Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1989, Ser. No. 425,963

Claims priority, application Japan, Oct. 26, 1988, 63-270573

Int. Cl.[5] C04B *35/04*

U.S. Cl. 252—62.54 **8 Claims**

1. A magnetic coating comprising magnetic powder, a binder and an organic solvent, characterized in that at least one component of the binder is a vinyl chloride copolymer having hydroxyl groups, and carboxylic acid groups or sulfur or phosphorus-containing strong acid radicals, and the comonomer supplying the hydroxyl groups is a monoallyl ether of polyhydroxy compound.

4,983,312

REFRIGERANTS

Koji Tamura, Kawanishi; Hiroshi Kashiwagi, Settsu, and Masahiro Noguchi, Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/00951, § 371 Date May 19, 1989, § 102(e) Date May 19, 1989, PCT Pub. No. WO89/02455, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 21, 1988, Ser. No. 358,364

Claims priority, application Japan, Sep. 21, 1987, 62-238439

Int. Cl.[5] C09K *5/04*

U.S. Cl. 252—67 **4 Claims**

1. A refrigerant consisting essentially of 95 to 5% by weight of tetrafluoroethane and respectively 5 to 95% by weight of either chlorodifluoromethane or chlorodifluoroethane.

4,983,313

REFRIGERATING MACHINE OIL COMPOSITION

Masato Kaneko, Ichihara; Minoru Takagi, Tokyo; Takashi Sunaga, Moriguchi; Takeo Komatsubara, Moriguchi, and Taira Mutoh, Moriguchi, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo and Sanyo Electric Co., Ltd., Osaka, both of, Japan

Filed Mar. 28, 1990, Ser. No. 500,500

Claims priority, application Japan, Mar. 30, 1989, 64-76493

Int. Cl.[5] C10G *71/00*

U.S. Cl. 252—68 **12 Claims**

1. A refrigerating machine oil composition comprising:

(A) 85 to 30% by weight of alkyl benzene having a kinematic viscosity at 40° C. of 30 cSt or more;

(B) 5 to 70% by weight of a paraffin-based mineral oil having a kinematic viscosity at 40° C. of 20 to 500 cSt, a pour point of −35° C. or lower, a viscosity index of 60 or more, and a sulfur content of 100 ppm or less; and

(C) 1 to 30% by weight of a naphthene-based mineral oil having a kinematic viscosity at 40° C. of 5 to 500 cSt, a pour point of −30° C. or lower, and a sulfur content of 0.05 to 1% by weight, the total sulfur content of said composition being 0.01 to 0.10% by weight.

4,983,314

QUICK CAR-COOLING COMPOSITION

Cal Yudin, Dunwoody, Ga., assignor to North American Oil Company, Inc., Atlanta, Ga.

Filed Mar. 14, 1990, Ser. No. 493,209

Int. Cl.[5] C09K *5/00*

U.S. Cl. 252—71 **2 Claims**

1. A quick-cooling composition, consisting essentially of:

about 5–15% by volume of methanol;

about 20% by volume of a propellent;

about 0.5% by weight of sodium benzoate;

about 0.2% by volume of fragrance;

about 0.2% by volume of morpholine; and

about 64.1 to 74.1% of deionized water.

4,983,315

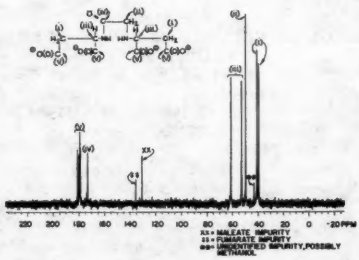
N,N'-(1-OXO-1,2-ETHANEDIYL)-BIS(ASPARTIC ACID), SALTS AND USE IN DETERGENT COMPOSITIONS

Mark W. Glogowski; Frederick A. Hartman; Stephen W. Heinzman, and Christopher M. Perkins, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

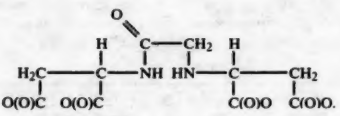
Filed Aug. 10, 1989, Ser. No. 392,168

Int. Cl.[5] C01B *15/037*; C02F *5/12*; C11D *3/33*; C07C *229/26*

U.S. Cl. 252—102 **20 Claims**


220 200 180 160 140 120 100 80 60 40 20 0 -20 PPM
XS = MALEATE IMPURITY
SS = FUMARATE IMPURITY
••• = UNIDENTIFIED IMPURITY, POSSIBLY METHANOL

1. A N,N'-(1-oxo-1,2-ethanediyl)-bis(aspartate) compound, or stereoisomer thereof, comprising an OEDBA moiety of the formula:



4,983,316

DISPERSIBLE SILICONE ANTIFOAM FORMULATIONS

Michael S. Starch, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 4, 1988, Ser. No. 228,079
Int. Cl.[5] B01D *19/04*
U.S. Cl. 252—174.15 10 Claims

1. In a liquid laundry detergent containing surfactants, builders, and at least one foam control agent the improvement comprising a dispersible silicone antifoam composition for providing controlled foaming of the laundry detergent comprised of a non aqueous emulsion of primary and secondary antifoam agents, the primary antifoam agent being a mixture of (a) a polyorganosiloxane, (b) a resinous siloxane or a silicone resin-producing silicon compound, (c) a finely divided filler material, and (d) a catalyst to promote the reaction of mixture components (a), (b), and (c), to form silanolates, the secondary antifoam agent being a polydimethysiloxane fluid, at least one nonionic silicone surfactant, a first organic surfactant dispersing agent, and a second dispersing agent of a nonionic difunctional block-copolymer terminating in primary hydroxyl groups.

4,983,317

ALL PURPOSE CLEANER CONCENTRATE COMPOSITION

Luz P. Requejo, and George B. Keyes, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Continuation of Ser. No. 850,636, Apr. 11, 1986, abandoned, which is a continuation of Ser. No. 618,618, Jun. 8, 1984, abandoned. This application Apr. 8, 1988, Ser. No. 179,083
Int. Cl.[5] C11D *3/37*
U.S. Cl. 252—174.24 24 Claims

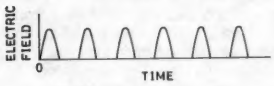
1. A hard surface cleaner composition concentrate comprising on an active basis by weight of said concentrate from about 1 to about 10% of an organic solvent; from about 3 to 15% of a surfactant selected from the group consisting of nonionics, anionics, and combinations of same; from about 2.5 to about 6.5% of a builder system comprising from about 97.4 to about 94.9% of a first builder, and from about 2.6 to about 5.1% of a second builder that is a polyacrylic acid resin of soluble salt thereof having a molecular weight of from about 500 to about 8,000, said first and second builders being different one from the other; from about 1 to about 6% of a hydrotrope that is an alkali metal salt of a C21 cyclohexene dicarboxylic acid, the weight ratio of said hydrotrope to said second builder being in the range of 1:1 to 20:1, and water.

4,983,318

METHOD FOR ELECTRIC FIELD ORIENTATION OF LIQUID CRYSTAL POLYMERS AND ORIENTED MATERIALS OF LIQUID CRYSTAL POLYMERS OBTAINED BY THE METHOD

Mitsuo Matsumoto; Kiyoto Ohtsuka; Koichi Sato, all of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jun. 3, 1988, Ser. No. 201,860
Claims priority, application Japan, Jun. 3, 1987, 62-140311; Mar. 9, 1988, 63-57134
Int. Cl.[5] C09K *19/52;* F21V *9/00;* G02B *5/02*
U.S. Cl. 252—299.01 25 Claims



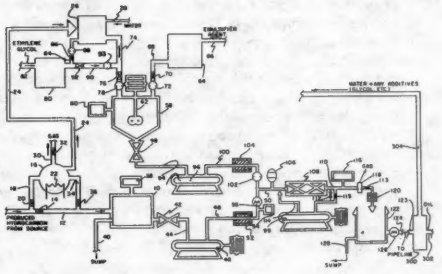
1. A method for electric field orientation of liquid crystal polymers which comprises subjecting a liquid crystal polymer capable of forming an optically anisotropic melt phase to a pulsating electric field which is predominantly unidirectional and which has a frequency of not less than 10 Hz so that the molecules of said liquid crystal polymer are uniformly oriented and polarized.

4,983,319

PREPARATION OF LOW-VISCOSITY IMPROVED STABLE CRUDE OIL TRANSPORT EMULSIONS

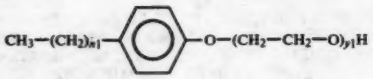
Armand A. Gregoli, Tulsa, Okla.; Andrew M. Olah, Spencer, Ohio; John A. Hamshar, Owasso, and Daniel P. Rimmer, Broken Arrow, both of Okla., assignors to Canadian Occidental Petroleum Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 114,204, Oct. 27, 1987, which is a continuation-in-part of Ser. No. 934,683, Nov. 24, 1986, Pat. No. 4,725,287. This application Jul. 14, 1988, Ser. No. 218,902
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[5] B01J *13/00;* C10L *1/32;* F17D *1/16*
U.S. Cl. 252—314 29 Claims



1. A process for preparing an oil-in-aqueous phase emulsion comprising:

agitating a hydrocarbon with an emulsifying composition having a temperature of from about 35 degrees F. to about 170 degrees F. and comprising an aqueous phase and a minor amount of an emulsifying agent to form an oil-in-aqueous phase emulsion within about 20 seconds, wherein the amount of aqueous phase in said oil-in-aqueous phase emulsion is from about 10% to about 60% by weight, wherein the emulsifying agent is used in an amount sufficient to assist in the formation of said oil-in-aqueous phase emulsion, and wherein said emulsifying agent comprises at least one ethoxylated alkylphenol compound having the general formula:



wherein n_1 is an integer having a value of from about 7 to about 14, and y_1 is an integer having a value of from about 4 to about 200; and said at least one ethoxylated alkylphenol compound has a molecular weight distribution with a dispersity of from about 1.0 to about 5.0 and with a weight average molecular weight of from about 558 to about 2504; and wherein at least about 50% by weight of the emulsifying agent comprises said at least one ethoxylated alkylphenol compound having a molecular weight of from about 558 to about 2504; and from about 1% by weight to about 10% by weight of the emulsifying agent comprises said at least one ethoxylated alkylphenol compound wherein y_1 has a value greater than 100; and said agitating comprises positioning said hydrocarbon and emulsifying composition in at least one dynamic shearing and mixing means for shearing and mixing said hydrocarbon and emulsifying composition.

4,983,320

DIALKYL DICARBONATES AS BLOWING AGENTS FOR POLYMERS

Ralph Franklin; William J. Parr, both of Naperville, Ill.; Gerald Fesman, Teaneck, N.J., and Barry A. Jacobs, Bethel, Conn., assignors to Akzo N.V., Arnhem, Netherlands

Filed May 18, 1989, Ser. No. 353,852

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—350 **5 Claims**

1. A catalyzed blowing agent composition for use in producing polymeric foams, wherein the polymeric reactants initiate reaction at about room temperature and wherein the catalyzed blowing agent composition comprises:

(a) at least one blowing agent comprising a dialkyl dicarbonate selected from the group consisting of diisopropyl dicarbonate, diisobutyl dicarbonate, t-butylmethyl dicarbonate, dicarbonates having alkyl substituent end groups containing from 1 to 10 carbon atoms with at least one of said end groups being a tertiary alkyl and dicarbonates having alkyl substitutent end groups having a linking group between the dicarbonate portions of the molecule having the formula $-(CH_2)_n-O-(CH_2)_m$ wherein n=1 to about 7, m=1 to about 6; and

(b) at least one dicarbonate decomposition catalyst comprising a tertiary amine having at least one sterically accessable nitrogen which exhibits high nucleophilicity selected from the group consisting of tertiary amine molecules having a bridgehead nitrogen, tertiary 4-amino derivatives of pyridine, dimethyl alkyl amines, poly dimethyl alkyl amines containing linking groups, and combinations thereof, the combination of dialkyl dicarbonate and decomposition catalyst being selected so as to be capable of providing decomposition greater than 100 ml/min/g over a temperature range of about 10° C. to about 45° C.

4,983,321

CORROSION PREVENTION CONSTITUENT FOR SURFACE COATINGS

David C. Sayles, Huntsville, Ala., assignors to The United States of America, as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 5, 1989, Ser. No. 362,556

Int. Cl.[5] C09K *3/00;* **C04B** *9/02;* **C09D** *5/08*

U.S. Cl. 252—387 **2 Claims**

1. A corrosion prevention surface primer coating composition as specified in weight percent ranges set forth in Table II hereinbelow for the ingredients comprising a corrosion-preventing soyabean-glycerol alkyd resin; a corrosion preventer compound barium metaborate; a dispersion resin; metal compounds as additives; petroleum thinner; n-butanol, and napthenate drying agents, said corrosion-preventing soyabean-glycerol alkyd resin prepared from the ingredients and by the manufacture procedure set forth under Table I as follows:

TABLE I

INGREDIENTS/MANUFACTURE PROCEDURE	
INGREDIENTS	WEIGHT (lbs)
Soyabean oil	175.0
Glycerol	90.5
Fused litharge	.25
Phthalic anhydride	161.0
Butylphenol resin	13.5
China wood oil	88.5
Xylene	353.5
Petroleum thinner	151.5

MANUFACTURING PROCEDURE		
TIME	TEMPERATURE	OPERATION
		Soyabean oil loaded into reaction kettle
		Glycerol loaded
0:00		Heat on
1:30	400° F.	Litharge loaded
2:00	440° F.	Gained
2:30	440° F.	Hold until clear solution formed
2:30	440° F.	Phthalic anhydride loaded
2:45	450° F.	Gained cautiously
4:30	450° F.	Butylphenol resin loaded
4:40	450° F.	China wood oil loaded
4:50	450° F.	20 CFM carbon dioxide blow
5:20	450° F.	30 CFM carbon dioxide blow
		Allowed to cool to 425° F.
5:40	425° F.	Held
6:30	425° F.	Dropped into xylene
		Thinned with petroleum thinner,

said Table II identified hereinabove and set forth hereinbelow with ingredients and composition weight percent range as follows:

TABLE II

Composition	
Ingredients	Weight Percent, Range
Corrosion-preventing soyabean-glycerol alkyd resin (Table I)	30.00–32.00
Barium metaborate (corrosion preventer compound)	36.00–38.00
Phenol-formaldehyde (dispersion resin)	6.00–7.00
Metal compound additives:	
titanium dioxide	5.00–6.00
black iron oxide	1.00–2.00
magnesium silicate	5.00–7.50
aluminum silicate	0.30–0.60
Petroleum thinner	10.00–12.20
n-Butanol	0.40–0.80
Naphthenate drying agents:	
cobalt naphthenate	0.10–0.30
manganese naphthenate	0.10–0.30
iron naphthenate	0.10–0.30.

4,983,322

SOLUTION PROCESSIBLE FORMS OF ELECTRICALLY CONDUCTIVE POLYANILINE

Ronald L. Elsenbaumer, Morristown, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

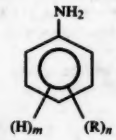
Filed Jan. 12, 1987, Ser. No. 2,528

Int. Cl.[5] A01B *1/06*

U.S. Cl. 250—500 **35 Claims**

1. A conductive material selected from the group consisting of solutions and plasticized compounds comprising one or more solvents selected from the group consisting of solvents having a dielectric constant equal to or greater than about 25

and a dipole moment equal to or greater than about 3.25; one or more dopant solutes selected from the group consisting of oxidizing dopants which form a charge transfer complex with the polyaniline having a conductivity equal to or greater than about $10^{-3}ohm^{-1}cm^{-1}$; and a substituted or unsubstituted polyaniline having a molecular weight or greater than about 15,000 prepared by polymerizing an aniline of the Formula I:



wherein:

n is an integer from 0 to 4;

m is an integer from 0 to 5 with proviso that the sum of n and m is 5;

R is the same or different at each occurrence and is alkyl, alkenyl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, alkylsulfinyl, alkoxyalkyl, alksulfonyl, aryl, arylthio, arylsulfinyl, alkoxycarbonyl, arylsulfonyl, carboxylic acid, halogen, cyano, or alkyl substituted with one or more sulfonic acid, carboxylic acid, halogen, nitro, cyano or epoxy moieties; or any two R substitutents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered aromatic or alicyclic carbon ring, which ring may include one or more divalent heteroatoms of nitrogen, sulfur, sulfinyl, sulfonyl or oxygen.

4,983,323

SURFACTANT COMPOSITIONS

Michael F. Cox; Peter A. Schwab, and Dewey L. Smith, all of Ponca City, Okla., assignors to Vista Chemical Company, Houston, Tex.

Filed Apr. 12, 1989, Ser. No. 337,065

Int. Cl.[5] C11D *1/12, 1/755;* C07C *43/11, 43/18*

U.S. Cl. 252—551 **7 Claims**

1. A composition for use in formulating detergents comprising:

water;

a viscosity imparting amount of a neutral salt thixotrope; and

an effective amount of a water-soluble salt of an ether sulfate having the formula

$$[R—(A)_nO—SO_3]_xM$$

wherein R is a hydrocarbon group containing from about 4 to about 30 carbon atoms, A is an oxyalkylene group selected from oxyethylene, oxypropylene, oxybutylene, oxytetramethylene and heteric and block mixtures thereof, n is an integer from 1 to 8 and M is a cation of a water-soluble salt, and wherein when the average of n is from 1 to 8, at least about 85% by weight of said ether sulfate has a number average oxyalkylene number of p−2 to p+3, wherein p represents the number of oxyalkyene groups of the most prevalent oxyalkylate species, and x is 1 or 2 depending on the valence of M.

4,983,324

PYRROLO(1,2-B)AZINES

Heinz Dürr, Saarbrücken-Schafbrücke, and Volker Bach, Kirkel, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

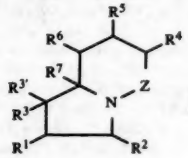
Filed Nov. 25, 1988, Ser. No. 283,997

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3710889; PCT Int'l Appl., Mar. 21, 1988, PCT/EP88/00229

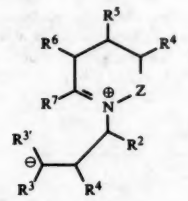
Int. Cl.[5] E21V *9/04;* G02B *6/10*

U.S. Cl. 252—587 **13 Claims**

1. In a device for displaying a non-linear optical effect, said device containing a non-linear optical material, the improvement wherein said non-linear optical material comprises, at least one component containing the structure of a pyrrolo[1.2-b]azine radical of the formula I and/or its valence isomers of the formula I'



I



I'

in which one of the double bonds represented as dashes can be a single bond between the positions 2-3, 5-6, and 7-8, and wherein

R^1 is C_1–C_{10}-alkoxycarbonyl, C_1–C_{10}-alkanoyl, C_7–C_{11}-aroyl, —CN, —CF_3, —$N(C_{1-4}\text{-alkyl})_2$ or H, if R^2 is not also H at the same time;

R^2 is H or a radical R^1;

R^3 and $R^{3'}$ are a radical completing a dibenzocyclopentadiene ring, dichlorobenzocyclopentadiene ring, monobenzodiphenylcyclopentadiene ring, tetraphenylcyclopentadiene ring, dibenzocyclohexa-2,5-diene-4-one ring or its 4-thione, 4-(C_{1-4}-alkyl)imino or 4-ethylidene derivative, indan-1,3-dione-2,2-diyl ring, 2,2-dimethyl-1,3-dioxane-4,6-dione-5,5-diyl ring, or of a dibenzo-γ-pyran ring, or

R^3 and $R^{3'}$ are each, independently from one another, phenyl, C_{1-10}-alkoxycarbonyl, C_{1-10}-alkanoyl, 4-nitrophenyl, 4-cyanophenyl or C_1–C_{10}-alkoxy-propenoyl, or one of the radicals is also H;

R^4 is H, C_1–C_{10}-alkyl or, together with R^5, a radical completing a fused cyclopentane or cyclohexane ring;

R^5 is H, C_1–C_{10}-alkyl, C_{1-10}-alkoxy, C_{1-10}-alkoxycarbonyl, —CN, —CH_2Ph, —COPh, —$CONH_2$, —CON—(C_{1-4}-alkyl)$_2$, —CONH(C_{1-4}-alkyl) or, together with R^4, is a radical completing a fused cyclopentane or cyclohexane ring or, together with R^6, a radical completing a fused benzene ring;

R^6 is H, C_{1-10}-alkyl or, together with R^5, a radical completing a fused benzene ring or, together with R^7, a radical completing a fused cyclopentane or cyclohexane ring;

R^7 is H, C_{1-10}-alkyl or, together with R^6, a radical completing a fused cyclopentane or cyclohexane ring; and

Z is —N=, —CR^4= or —CHR^4—, with the proviso that if Z is —CR^4= or —CHR^4—, then R^4 is H or C_{1-10}-alkyl,

wherein said material exhibits non-linear optical effects.

4,983,325

HIGH PERFORMANCE NONLINEAR OPTICAL MEDIA

Eui W. Choe, Randolph; Alan Buckley, Berkeley Height; Dagobert E. Stuetz, Watchung, all of N.J., and Anthony F. Garito, Radnor, Pa., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 89,512, Aug. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 855,346, Apr. 24, 1986, abandoned, which is a division of Ser. No. 748,617, Jun. 25, 1985, Pat. No. 4,707,303. This application Apr. 4, 1989, Ser. No. 333,719

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[5] G02B 5/172; G02F 1/00; H01S 3/10

U.S. Cl. 252—600 2 Claims

1. A transparent nonlinear optical medium produced by a process which comprises subjecting a melt-phase organic medium characterized by an optical susceptibility $\chi^{(3)}$ of at least about 2×10^{-9} esu to an external field to induce a noncentrosymmetric molecular orientation of mobile molecules, wherein the induced molecular orientation is maintained when the melt-phase is solidified, and wherein the transparent nonlinear optical organic substrate is characterized by an optical susceptibility $\chi^{(2)}$ of at least about 1×10^{-7} esu, an absence of interfering fluorescence in the wavelength range between about 0.3–3 μm, and an optical loss less than about 1.0 decibel per centimeter.

4,983,326

FIRE RETARDANT CONCENTRATES AND METHODS FOR PREPARATION THEREOF

Howard L. Vandersall, Upland, Calif., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 9,305, Jan. 30, 1987, Pat. No. 4,839,065. This application Dec. 22, 1988, Ser. No. 288,656

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] C09K 21/00; C09D 5/16, 5/18; A62D 1/00

U.S. Cl. 252—603 10 Claims

1. An aqueous concentrate adapted to be diluted with water to produce a fire control mixture suitable for use in fire control, the aqueous concentrate exhibiting a concentration of from about 0.75% to about 6% by weight of a thickening agent, a concentration of at least about 24% and at most about 75% by weight solids derived from a fire retardant selected from the group consisting of diammonium phosphate, diammonium sulfate, a blend of diammonium phosphate and diammonium sulfate, a blend of monoammonium phosphate and diammonium phosphate having a nitrogen-to-phosphorus ratio of at least about 1.25, a blend of monoammonium phosphate, diammonium sulfate and diammonium phosphate having a nitrogen-to-phosphorus ratio of at least about 1.25, and polyammonium phosphate, with the proviso that when polyammonium phosphate is the fire retardant component, it is admixed with at least one additional fire retardant component in an amount sufficient to provide the solids % by weight concentration derived from the fire retardant, and a viscosity of less than about 2000 centipoise, with the proviso that the viscosity of the aqueous concentrate is substantially equal to or less than the viscosity of the fire control mixture produced therefrom upon dilution with water.

4,983,327

PROCESS FOR ISOLATING A PHOSPHATIDYLCHOLINE FREE OF OTHER PHOSPHOLIPIDS IN THE STARTING MATERIAL

Bernd-Rainer Günther, Bergheim, and Rainer Losch, Bonn, both of Fed. Rep. of Germany, assignors to A. Nattermann & CIE GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 57,699, May 26, 1987, abandoned, which is a continuation of Ser. No. 806,768, Dec. 9, 1985, abandoned. This application Jun. 30, 1988, Ser. No. 214,844

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445949

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] C11C 1/02; C11B 7/00, 1/10

U.S. Cl. 260—403 5 Claims

1. A process for isolating phosphatidylcholine from vegetable lipid mixtures wherein the lipid mixture is dissolved in a solvent mixture of 1 part by volume of a petroleum ether fraction (65°–73° C.), 1 part by volume of propanol-2 and 0.175 part by volume of water is used, the solution is introduced into a column filled with silica gel at a temperature in the range from 20° to 50° C., the elution is carried out at this temperature with the same solvent mixture and the main run is collected and a pure phosphatidylcholine free of other phospholipids present in the starting vegetable lipid mixture is isolated therefrom.

4,983,328

N-(4-(3-AMINOPROPYL)AMINOBUTYL)-2-(ω-GUANIDINO-FATTY-ACID-AMIDO(-2-SUBSTITUTED-ETHANAMIDE, SALT THEREOF, AND PROCESS FOR PREPARATION THEREOF

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama; Hironobu Iinuma; Daishiro Ikeda, both of Tokyo; Teruya Nakamura, Kusatsu, and Akio Fujii, Kamakura, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 15, 1988, Ser. No. 170,611

Continuation of Ser. No. 65,665, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 690,332, Jan. 10, 1985, abandoned, which is a division of Ser. No. 426,372, Sept. 29, 1982, now Pat. No. 4,518,532.

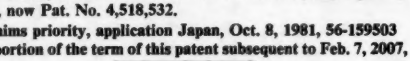
Claims priority, application Japan, Oct. 8, 1981, 56-159503

The portion of the term of this patent subsequent to Feb. 7, 2007, has been disclaimed.

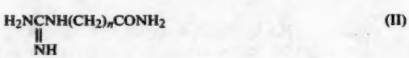
Int. Cl.[5] C09F 5/00, 5/06

U.S. Cl. 260—404.5 3 Claims

1. A process for preparing an N-[4-(3-aminopropyl)-aminobutyl]-2-(ω-guanidinofatty-acid-amido)-2-hydroxy-ethanamide represented by the general formula

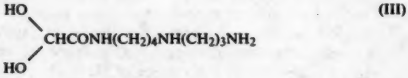


wherein n represents an integer of 3–8, which comprises contacting under reaction conditions an ω-guanidinofatty acid amide represented by the following formula (II):



(II)

wherein n is as defined above with N-[4-(3-aminopropyl-)aminobutyl]-2,2-dihydroxyethanamide represented by the following formula (III):



(III)

4,983,329

PREPARATION OF ESTERIFIED PROPOXYLATED GYLCERIN FROM FREE FATTY ACDIDS

Charles F. Cooper, Paoli, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 237,018, Aug. 26, 1988, abandoned. This application Jul. 27, 1989, Ser. No. 384,142

Int. Cl.[5] C11C *3/02*

U.S. Cl. 260—410.7 14 Claims

1. A method for the preparation of an esterified propoxylated glycerin which comprises the steps of:

propoxylating glycerin at a temperature of from about 70° C. to about 130° C. with propylene oxide, added at the autogenous pressure of the reaction system, in the presence of from about 0.0003 mol to about 3.3 mol of alkali metal content of an alkali metal alkoxylate catalyst per 100 g glycerin employed to give a propoxylated glycerin having from 2 to 100 oxypropylene oxide units per glycerin;

esterifying the propoxylated glycerin directly, without the removal of alkali metal propoxylated glycerin catalyst, at a temperature of from about 100° C. to about 250° C. with an excess of a saturated or unsaturated C10 to C24 fatty acid or mixtures thereof to provide an esterified propoxylated glycerin product; and

purifying the esterified propoxylated glycerin product by a wash extraction with methanol at temperatures of from about −10° C. to about 50° C., or vacuum steam stripping at temperatures of from about 180° C. to about 220° C. to remove excess unreacted fatty acid, followed by neutralization with an alkali metal hydroxide and filtering to essentially remove and reduce alkali metal content and to provide a food grade esterified propoxylated glycerin.

4,983,330

MEMBRANE CARBURETOR HAVING A COUPLING ARRANGEMENT FOR COUPLING THE CHOKE AND THROTTLE FLAPS TO EACH OTHER

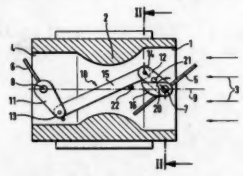
Jög Harbeke, Waiblingen-Beinstein, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 20, 1989, Ser. No. 453,961

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842974

Int. Cl.[5] F02M *1/02*

U.S. Cl. 261—52 10 Claims



1. A carburetor for an internal combustion engine of a portable handheld tool such as a motor chain saw, brushcutter or the like, the engine being operable in an idle running condition, in a part load range and in a full-throttle running condition, the carburetor comprising:

an intake channel through which air flows to the engine;

a choke flap movably mounted in said intake channel so as to be movable between a full choke position wherein said choke flap substantially closes said channel and a no-choke position wherein the choke flap fully opens said channel;

a throttle flap mounted in said intake channel in spaced relationship to said choke flap measured in the direction of the air flow through said channel, said throttle flap being movable between a first position corresponding to the idle running condition of the engine and a second position corresponding to the full-throttle running condition of the engine;

kinematic linkage means for position-dependently connecting said flaps to each other and being movable from a start position wherein said throttle flap is in a part-open position between said first and second positions and said choke flap is in said full-choke position to a full-throttle position wherein said choke flap is in said no-choke position and said throttle flap is in said second position;

said kinematic linkage means also being movable for adjusting the position of said choke flap to correspond to the position of said throttle flap when the engine operates in said part-load range;

actuation means for pivoting said choke flap independently of its position predetermined by said linkage means so as to bring said choke flap into said full-choke position; and,

said linkage means including: resilient biasing means for pivotally biasing said choke flap through a positioning path into said no-choke position; and, stop means arranged in said positioning path for drive-connecting said choke flap to said linkage means via said resilient means.

4,983,331

METHOD FOR FORMING A PATTERN FOR PRODUCING OCCLUSAL SPLINTS

Thomas B. Wise, 2568 Cheyenne Pl., Saginaw, Mich. 48603

Division of Ser. No. 197,516, May 22, 1988, Pat. No. 4,881,713. This application Aug. 1, 1989, Ser. No. 388,119

Int. Cl.[5] A61C *13/00*

U.S. Cl. 264—16 6 Claims

1. A method of forming a pattern for subsequent use in the molding of a dental splint, said method comprising heating a sheet of waxy material that is form-stable at room temperature to an elevated temperature at which said material becomes plastic; introducing said material in its plastic state between a pair of movable mold halves having confronting surfaces forming respectively a substantially U-shaped die and a complementary cavity shaped to form a substantially U-shaped member having a pair of spaced apart limbs converging in a direction toward one end of said member and joined at corresponding ends to one another by an arcuate bight, said confronting surfaces also having complementary projections and depressions at spaced intervals along said bight; manually deforming said sheet of material in said mold while said material is in its plastic state to conform said material generally to the configuration of said die; applying sufficient force on the deformed material in said mold by movement of said mold halves toward one another to cause said material to flow throughout the space between said confronting surfaces and produce a trough-like, substantially U-shaped member having a base from one side of which spaced inner and outer side walls extend in the same direction, said base having an inner surface between said side walls that is substantially flat and an opposite, outer surface that is substantially flat except for protrusions caused by said material occupying said depressions, said side walls being of substantially uniform thickness; and cooling said member to room temperature to produce said pattern.

4,983,332

METHOD FOR MANUFACTURING HYDROPHILIC CONTACT LENSES

Dennis Hahn; Gary A. Johansson, both of Rochester; Dominic V. Ruscio, Webster, and Christopher E. Blank, Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 21, 1989, Ser. No. 397,143
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—1.1 4 Claims

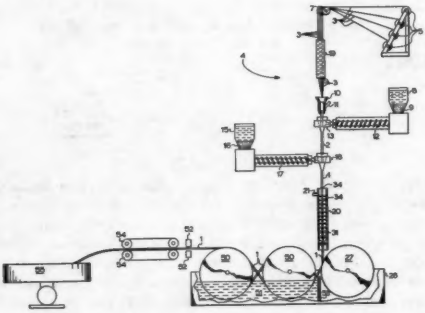
1. An improved method for manufacturing contact lenses wherein monomer or comonomer mixture is placed in a mold cavity wherein at least one surface is formed of polyvinylchloride polymer and subjected to polymerization conditions to form a polymerized shape wherein the improvement comprises the inclusion of a release agent in the monomeric mixture, wherein said release agent comprises less than about three weight percent of said monomeric mixture and is a mixture of a nonreactive polyoxyalkylene polymer and a fatty acid.

4,983,333

METHOD FOR CONTROLLING EXCESS FIBER LENGTH IN A LOOSE TUBE OPTICAL FIBER BUFFER TUBE

Douglas J. Blew, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Division of Ser. No. 310,961, Feb. 16, 1989, Pat. No. 4,921,413. This application Jan. 29, 1990, Ser. No. 476,808
Int. Cl.[5] B29D *11/00*; B29C *47/78*
U.S. Cl. 264—1.5 9 Claims



1. A method of cooling an elongated member comprising:
(a) providing an elongated tubular shaped member;
(b) providing a water blocking device disposed in one portion of said tubular shaped member, said water blocking device having a body, said body having a chamber, inlet and outlet ports communicating with said chamber defining a path of travel, means for draining fluid from said chamber, and a means for directing gas against the path of travel;
(c) traversing said elongated member along said path of travel while supplying a liquid to that portion of the tubular shaped member above the water blocking member;
(d) directing a stream of gas against the surface of said elongated member and driving fluid thereon into said chamber;
(e) removing from said chamber fluid collected therein; and,
(f) removing the elongated member from said water blocking device and said tubular shaped member at a predetermined elevated temperature.

4,983,334

METHOD OF MAKING AN ORTHODONTIC APPLIANCE

Loren S. Adell, 6207 Telluride La., Dallas, Tex. 75252, assignor to Loren S. Adell and Michael Adell both at Sunnyvale, Tex

Division of Ser. No. 901,729, Aug. 28, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,012
Int. Cl.[5] A61C *13/00*
U.S. Cl. 264—16 4 Claims

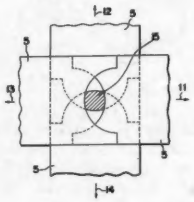
1. The method of making an orthodontic appliance for repositioning teeth of an arch which comprises:
taking an impression of the arch including the teeth that are to be repositioned and creating from said impression a dental cast in which the teeth to be repositioned are reset to a placement that is desired to be obtained by use of the orthodontic appliance;
providing a sheet of an elasticized thermoplastic material containing an integral pattern of fibers which are capable of exerting tension forces;
heating the thermoplastic material to plastic or semi-plastic state, and;
forming the plastic or semi-plastic material onto said dental cast and allowing the material to cool and assume its relatively more rigid condition.

4,983,335

METHOD FOR PRODUCING TRANSPARENT PLASTIC ARTICLE

Takahiro Matsuo, and Takao Inoue, both of Hirakata, Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 938,981, Dec. 3, 1986, abandoned. This application Dec. 29, 1988, Ser. No. 291,352
Claims priority, application Japan, Dec. 3, 1985, 60-271851; Dec. 17, 1985, 60-283444; Feb. 17, 1986, 61-32311; Mar. 14, 1986, 61-57216
Int. Cl.[5] B29C *35/08*; B29D *11/00*
U.S. Cl. 264—25 3 Claims



1. A method for producing a transparent plastic article, which comprises the steps of
(1) charging a photopolymerizable liquid monomer into a mold transparent to ultraviolet light,
(2) shielding a portion of the monomer by a shielding plate and irradiating the unshielded portion of the monomer with ultraviolet light to form, in said unshielded portion, a polymerized resin part, a gel state part comprising the unreacted monomer and the polymerized resin and a part of the unreacted monomer,

(3) flowing the gel and/or the unreacted monomer into a cavity formed in the mold by cure shrinkage of the monomer,

(4) shielding the already polymerized portion and irradiating a wider area than the area defined by the polymerized part formed in the previous irradiation step, and

(5) continually repeating the steps (3) and (4) till the polymerized area reaches the predetermined size.

4,983,336

METHOD OF CONTROLLING THE AFTERPRESSURE VARIATION WITH TIME OF AN INJECTION-MOULDING MACHINE

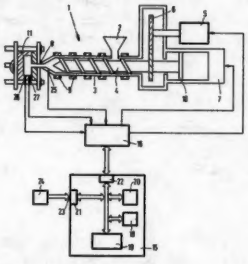
Jacques A. E. Langlois, Vellmar, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 263,096, Oct. 26, 1988, abandoned. This application Jan. 5, 1990, Ser. No. 462,992

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737959

Int. Cl.[5] B29C *45/77*

U.S. Cl. 264—40.5 **1 Claim**



1. A method of controlling variations of the afterpressure with time of an injection-molding machine comprising a plastification unit for providing a plastified molding mass, a molding injection unit comprising a worm operated by a hydraulic pressure drive for transporting said plastified molding mass into an injection nozzle, a molding tool for producing a molding, said molding tool contacting said injection nozzle and a process computer coupled to said hydraulic pressure drive, for controlling the movement of said hydraulic pressure drive, for storing a value of a given selectable reference variation of the afterpressure with time, for calculating and storing temperature values associated with said reference variations of the afterpressure with time, for calculating a new variation of the afterpressure with time upon variation of at least one of said molding mass temperature Tm and said tool temperature Tf measured in the molding tool, said computer comprising at least a first memory unit, a second memory unit, an input element, an output element and a calculating unit comprising storing in said first memory unit the values:

m, where m represents the temperature of the center of a typical standardized molding in the molding tool,

a, where a represents the thermal conductance of the molding mass,

n, where n represents the number of time data samples in the afterpressure variations with time,

i, where i represents the instantaneous time data sample,

F where F represents the standardized heat function calculated from a standard heat conduction equation

$$a*\Delta T(x,y,z,t)=\delta T(x,y,z,t)/t,$$

entering into said calculating unit at least one of Tm, where Tm represents the temperature of the molding mass, measured before the injection nozzle, and Tf, where Tf represents the tool temperature measured in the molding tool,

calculating in said calculating unit, by means of the equation

$$Ti=Tf+(Tm-Tf)*F(m,a*in*i/n)$$

the value of Ti, where Ti represents the reference temperature values associated with the reference variation of the afterpressure with time, storing in said second memory unit the value of F^{-1}, where F^{-1} is an inverse function of the function F, calculating in said calculating unit the value of ti, where ti represents the afterpressure variation with time of the afterpressure data samples corresponding to the reference temperature values and the reference afterpressure values by means of the equation

$$ti=\frac{1}{a}*F^{-1}\left[\frac{Ti-Tf}{Tm-Tf}\right]$$

and automatically controlling the movement of said hydraulic pressure drive in accordance with the value of ti.

4,983,337

METHOD AND APPARATUS FOR PRODUCING STRETCHED FILM

Hisashi Kojoh; Naoya Yamaguchi, both of Yatsushiro; Kazuhiro Tomoda, Hida, and Tomoji Mizutani, Yatsushiro, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

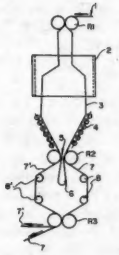
PCT No. PCT/JP88/01143, § 371 Date Jun. 30, 1989, § 102(e) Date Jun. 30, 1989, PCT Pub. No. WO89/04244, PCT Pub. Date May 18, 1989

PCT Filed Nov. 12, 1988, Ser. No. 381,713

Claims priority, application Japan, Nov. 12, 1987, 62-284191

Int. Cl.[5] B29C *55/28*

U.S. Cl. 264—41 **8 Claims**



1. A method for producing a stretched film comprising the steps of:

passing a tubular thermoplastic resin film between pairs of nip rolls having mutually different peripheral speeds, said pairs of nip rolls includes at least three pairs of nip rolls respectively, peripheral speeds of said pairs of nip rolls have a ratio set in a range of 0.1 through 0.8/1/1 through 1.1, a first pair of nip rolls is situated at an introducing side of a non-stretched film, a second pair of nip rolls is situated at a position after said first pair of nip rolls, and a third pair of drawing nip rolls is situated at a position after said second pair of nip rolls;

admitting pressurized air to said film located between said first and second pair of nip rolls, through a slit-like nozzle inserted between said second pair of nip rolls;

forming a bubble stretched and inflated by the supplied pressurized air;

inflating and stretching said bubble at least one time in size in a radial direction while heating said film;

collapsing said film with a collapser device;

feeding said collapsed film to said second pair of nip rolls;

cutting open both side ends of said collapsed film with film cutting knives positioned between said second pair of nip rolls to make two sheets of flat films;

inputting said flat films to left and right guide rolls so as to avoid interference with said slit-like injecting nozzle and said cutting knives; and

drawing said films with said third pair of nip rolls.

4. An apparatus for producing stretched films comprising:

at least three pairs of nip rolls respectively, peripheral speeds of said pairs of nip rolls have a ratio set in a range of 0.1 through 0.8/1/1 through 1.1, a first pair of nip rolls is situated at an introducing position of a tubular non-stretched film, a second pair of nip rolls is situated at a position after said first pair of nip rolls, a gap between the second pair of nip rolls is adjustable, and a third pair of drawing nip rolls is located at a position after said second pair of nip rolls;

a heater heating said introduced tubular film is provided between said first and second nip rolls;

a collapser device collapsing said film after said film is stretched to form a bubble, is provided between said first and second nip rolls;

a slit-like nozzle device injecting pressurized air into said bubble and two film cutting knife devices movable in a longitudinal direction of said second pair of nip rolls are provided between said gap in order to cut both side ends of said collapsed film; and

at least guide roll for guiding said cut film to make a film's path capable of avoiding said slit-like nozzle device and said cutting knife devices for each flat film.

4,983,338

ISOCYANURATE CROSSLINKED POLYURETHANE MEMBRANES AND THEIR USE FOR THE SEPARATION OF AROMATICS FROM NON-AROMATICS

Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 391,058, Aug. 9, 1989, Pat. No. 4,929,357.
This application Mar. 20, 1990, Ser. No. 496,464
Int. Cl.[5] B01D *67/00*
U.S. Cl. 264—45.1 10 Claims

1. A method comprising producing a non-porous isocyanurate crosslinked polyurethane membrane having properties at least sufficient for enabling the separation from mixture of the same with non-aromatic Hydrocarbons, by, preparing a prepolymer of polyurethane by reacting dihydroxy or polyhydroxy compounds with a di or poly isocyanate, trimerizing this prepolymer using a trimerization catalyst to produce a casting solution mixture which slowly thickens due to cross-linking caused by the formation of isocyanurate cross-linked rings, depositing this casting solution on a substrate to produce a thin film, permitting the thin film to fully gel into the desired isocyanurate cross-linked polyurethane membrane.

4,983,339

PROCESS FOR SHAPING A MATERIAL BY HOT ISOSTATIC PRESSING AND TITANIUM SHEATH USABLE IN THIS PROCESS

Marcel Boncoeur, Paris; Thierry Lieven, Montrouge, and Marc Palacio, Arcueil, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Aug. 5, 1988, Ser. No. 229,226
Claims priority, application France, Aug. 5, 1987, 87 11122
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—56 9 Claims

1. In a process for shaping a powder of a material enclosed within a sheath by isostatic pressing at a temperature of at least 1300° C. the improvement comprising the steps of providing said sheath of titanium or a titanium alloy, internally coating a tantalum layer on said sheath, and diffusing said tantalum into the titanium or titanium alloy in the presence of oxygen during isostatic compression to embrittle said sheath.

4,983,340

METHOD FOR FORMING A HIGH DENSITY METAL BORIDE COMPOSITE

Lionel C. Montgomery, Bay Village, Ohio, assignor to Union Carbide Coatings Service Technology Corporation, Danbury, Conn.

Filed Dec. 28, 1989, Ser. No. 458,347
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—63 7 Claims

1. A process for forming a dense metal boride composite article of predetermined shape comprising the steps of:

blending a boride of a metal from Group IVb of the periodic table with a nitride to form a blended mixture in a desired proportion corresponding to the desired electrical resistivity for composite article;

grinding the blended mixture to particles having a predetermined average size of between about 3–5 microns;

coating the particles with a lubricant of a resinous material formed from a composition of vinyl chloride and vinyl acetate dissolved in an organic resin;

cold forming the particles into an article of desired shape; and

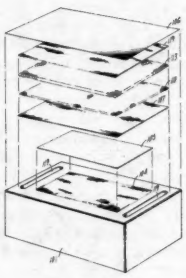
pressureless sintering the cold formed article under an inert atmosphere or vacuum to produce a high density article of substantially near theoretical density.

4,983,341

METHOD OF USING BREATHER MATERIALS FOR HIGH PRESSURE MOLDING

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,739
Int. Cl.[5] B29C *43/12, 43/18, 43/56*
U.S. Cl. 264—102 11 Claims



1. A method of molding a polymer containing article by transferring pressure via a gas impervious layer to the article, wherein a breather layer is disposed between the article and the gas impervious layer for removing fluids from the article during molding wherein the improvement comprises:

disposing a flexible breather between said gas impervious layer and said article, said breather layer comprising at least two layers of substantially spherical beads, each layer at least one bead thick, said beads bonded together with a flexible adhesive; and

transferring substantially uniform pressure from the breather layer to the article.

4,983,342

METHOD OF MAKING WATER AND FIRE RESISTANT BUILDING MATERIAL

Johannes G. Berg, Hovik, and Robert Smith-Johannsen, Borgheim, both of Norway, assignors to Norsk Proco A/S, Hovik, Norway

Division of Ser. No. 2,064, Jan. 12, 1987, Pat. No. 4,820,345.
This application Apr. 4, 1989, Ser. No. 332,923
Claims priority, application Norway, Jan. 10, 1986, 860066; Nov. 12, 1986, 864501
Int. Cl.[5] B28B *1/16, 3/00*
U.S. Cl. 264—113 24 Claims

1. A process for making a fire and water resistant building material which comprises:

arranging a plurality of components in layers to form a layered structure of the components, one of the layers comprising a first binder system of a magnesia cement and a lignin sulfonate salt, and another of the layers comprising a second binder system of chemically active fumed silica and an alkali silicate, the layers of binder systems being arranged to be separated from each other; and

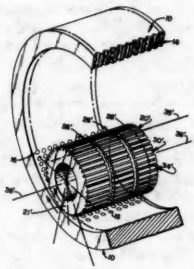
curing the layered structure at a suitable pressure and temperature and for a sufficient time to enable the first and second binder systems to cure independently, while also converting free water in the layers to a hydrate which is retained in the cured structure, thus forming the building material.

4,983,343

PRESSURE ROLLER INCLUDING AIR RELIEF MECHANISM

Robert E. Lund, Minneapolis, Minn., assignor to International Multifoods Corporation, Minneapolis, Minn.

Filed Sep. 6, 1988, Ser. No. 240,966
Int. Cl.[5] B28B *3/18;* B29B *9/06*
U.S. Cl. 264—142 21 Claims



19. A method of providing air relief during a process of extruding pellets made of compressed feed material, said method comprising:

(a) providing a pellet mill having a die and roller assembly including a pressure roller including an air relief channel, said pressure roller including a circular ring having a substantially circular cross-section, a circumferential outer surface and a longitudinal axis, said air relief channel cooperating with the extrusion die to allow air to escape at an air velocity of at least about 700 ft/min and not greater than about 1300 ft/min from feed material compressed between said die and roller assembly during operation of the pellet mill, and extending about said circumferential outer surface at an angle to a line parallel to said longitudinal axis;

(b) introducing particulate feed material into said pellet mill such that the particulate feed material can be compressed in the die and roller assembly; and

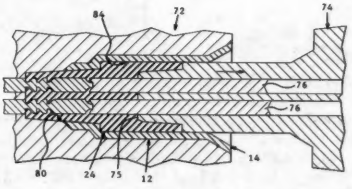
(c) compressing the particulate feed material between said outer surface of said roller and an annular inner surface of the die such that air escapes from the particulate material through said air relief channel at a velocity of at least about 700 ft/min and not greater than about 1300 ft/min as the particulate material is compressed.

4,983,344

METHOD FOR INJECTION MOLDING A SEALED CONNECTOR ASSEMBLY

Thomas E. Brown, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 285,672, Dec. 16, 1988, abandoned.
This application Jun. 22, 1990, Ser. No. 542,669
Int. Cl.[5] B29C *45/16*
U.S. Cl. 264—255 6 Claims



1. A method for molding a housing member for a sealed electrical connector, the housing member having an insulated body including a first relatively rigid portion and a second relatively flexible portion joined along a common interfacial surface, the method comprising the steps of:

selecting a thermoplastic material having a melting temperature of T_1;

selecting a thermoset material having a curing temperature of T_2, wherein T_2 is less than T_1;

selecting a mold apparatus defining a first mold cavity, a portion of said first cavity being defined by an inner face of a selected mold portion in a first position, said selected portion being retractable to at least a second position to define at least a second, larger mold cavity while the mold apparatus remains closed, said mold apparatus remaining closed continuously during said retracting of said selected portion;

injecting said thermoplastic material into said first mold cavity;

cooling said injected thermoplastic material to a temperature lower than T_1 and higher than T_2 thereby forming a solid first body portion, while maintaining a mold temperature at a level lower than T_1 and higher than T_2;

moving said selected mold portion while maintaining said mold apparatus closed, to form said at least second mold cavity adjacent said first mold cavity, said second mold cavity being at least partially defined by at least a section of a surface of the first body portion; and

injecting said selected thermoset material into said at least second cavity, said thermoset material being injected at a temperature below said curing temperature T_2; whereby

heat is transmitted across said common interfacial surface from said first body portion to said thermoset material adjacent thereto, facilitating rapid curing, in cooperation with heat transmitted to other portions of said thermoset material from the mold surfaces without opening said mold apparatus until after said thermoset material has been molded.

4,983,345

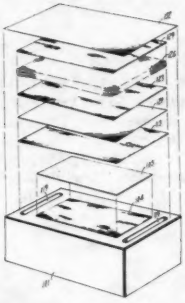
METHOD OF HIGH TEMPERATURE MOLDING USING A THERMAL BARRIER

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,738

Int. Cl.[5] B29C *43/10*

U.S. Cl. 264—313 21 Claims



1. A method of molding a article by transferring pressure from a pressure means to the article comprising:

(a) disposing a flexible insulation layer between said pressure means and said article, said insulation layer comprising at least two sublayers of substantially spherical beads, each sublayer at least one bead thick, said beads within each sublayer bonded together with an adhesive;

(b) transferring pressure from the pressure means via said flexible thermal insulation layer to the article during molding; and

(c) exposing the article to temperatures of about 316° C. to about 1371° C. during molding.

4,983,346

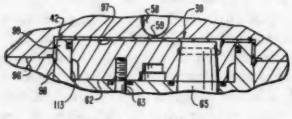
METHOD FOR MOLDING A ONE-PIECE MOLDEDEND CLOSURE

Danny R. Curliss, and Dwight E. Looney, both of Berea, Ky., assignors to Mt. Vernon Plastics Corporation, Mt. Vernon, Ky.

Division of Ser. No. 62,784, Jun. 15, 1987, Pat. No. 4,830,214, which is a continuation-in-part of Ser. No. 792,705, Nov. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 863,238, May 14, 1986, abandoned, which is a division of Ser. No. 796,705, Nov. 12, 1985, abandoned. This application May 1, 1989, Ser. No. 345,950

Int. Cl.[5] B29C *45/44*

U.S. Cl. 264—328.1 15 Claims



1. A method of molding a one-piece end closure for closing an open end of a container in which the end closure includes a main panel having at its periphery an annular surrounding portion, a pull ring disposed in spaced and substantially parallel relation to the main panel, and means connecting the pull ring to the main panel including:

injecting a molten plastic into a mold shaped to form the end closure and including first mold means having molding surface means, second mold means having first and second molding surface means, and third mold means having first and second molding surface means, the second mold means having passage means to receive a portion of the third mold means, the passage means in the second mold means having the second molding surface means of the second mold means and the portion of the third mold means having the second molding surface means of the third mold means cooperating with the second molding surface means of the second mold means to form the pull ring when the portion of the third mold means is disposed within the passage means in the second mold means so that the first molding surface means of the third mold means is in the same plane as at least the portion of the first molding surface means of the second mold means surrounding the first molding surface means of the third mold means;

disposing the portion of the third mold means within the passage means in the second mold means so that the first molding surface means of the third mold means is in the same plane as at least the portion of the first molding surface means of the second mold means surrounding the first molding surface means of the third mold means prior to injecting the molten plastic to form the end closure;

injecting the molten plastic between the molding surface means of the first mold means and the first molding surface means of each of the second mold means and the third mold means to form the main panel and the annular surrounding portion of the first end closure;

supplying the molten plastic from between the molding surface means of the first mold means and the first molding surface means of each of the second mold means and the third mold means to between the second molding surface means of each of the second mold means and the third mold means through communicating means in the second mold means with the connecting means being formed by the molten plastic in the communicating means;

producing relative movement between the third mold means and the second mold means to withdraw a portion of the third mold means from the passage means in the second mold means prior to producing relative movement between the first mold means and the second and third mold means without shearing of any molded material so that the pull ring is free to collapse prior to the relative movement between the first mold means and the second and third mold means to enable the pull ring to pass through the passage means in the second mold means when the formed end closure is disengaged from the first molding surface means of the second mold means;

producing relative movement between the first mold means and the second and third mold means substantially parallel to the direction of relative movement between the third mold means and the second mold means to disengage the formed end closure from one of the molding surface means of the first mold means and the first molding surface means of the second mold means without any shearing of the molded material;

and disengaging the formed end closure from the other of the molding surface means of the first mold means and the first molding surface means of the second mold means.

4,983,347

METHOD OF PRODUCING AN INTERNALLY SMOOTH, EXTERNALLY RIBBED TUBE FROM EXTRUDABLE PLASTIC AND APPARATUS FOR CARRYING OUT THE METHOD

Horst Rahn, Hassfurt, Fed. Rep. of Germany, assignor to UNICOR GmbH Rahn Plastmaschinen, Hassfurt, Fed. Rep. of Germany

Continuation of Ser. No. 266,051, Nov. 2, 1988, abandoned. This application Jan. 4, 1990, Ser. No. 462,941

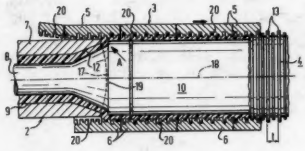
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3737588

Int. Cl.[5] B29C *47/76, 47/88*

U.S. Cl. 264—508 14 Claims

1. A method for producing from extrudable plastic an inter-

nally smooth tube having externally circumferentially extending ribs comprising extruding a plastic melt from a stationary nozzle into the interior of a moving mold passage having circumferentially extending rib forming depressions which form the ribs of the tube, pressing the melt against the inner



wall of the mold passage, forming the smooth tube inner wall by means of a mandrel provided in the mold passage, and delayed filing the depressions of the mold passage which form the ribs of the tube with the melt wherein the filling of at least one region extending over at least one separation joint of the mold passage is delayed.

4,983,348

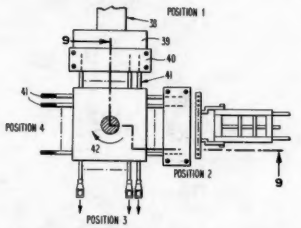
IN-MOLD LABELING OF INJECTION BLOW MOLDED PRODUCTS

Lawrence J. Barresi, Mays Landing, and Charles H. L. Reilly, Williamstown, both of N.J., assignors to Wheaton Industries, Millville, N.J.

Continuation of Ser. No. 924,691, Oct. 29, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 273,695

Int. Cl.[5] **B29C** *49/08, 49/24, 49/36*

U.S. Cl. 264—509 **10 Claims**



1. In a method for injection blow molding hollow thermoplastic articles, in an injection blow molding machine having split parison and blow molds which open along a common parting plane and which each comprises moveable and stationary mold halves which moveable mold halves are reciprocally moveable, in parallel, between a first, closed, position and a second, open, position, wherein work pieces are first injection molded, then blown and removed at successive work stations, and wherein transfer of the work pieces between work stations is accomplished by a turret which moves from a lower, work piece operating turret position, to a higher, rotating position, in concert with, and parallel to, said moveable mold halves and wherein said turret is in said lower, work piece operating turret position when said work pieces are in a lower, work piece operating work piece position and when said work pieces are in said blow and parison molds, which turret rotates about an axis and wherein core rods project radially from turret sides toward work stations facing said core rods, said method including the sequential steps of:

injection molding work pieces at the injection molding work station, and blow molding work pieces at the blow molding work station;

opening said blow and parison molds by moving said moveable blow and parison mold halves to their respective open positions;

removing work pieces from said work piece operating work piece position by raising said turret;

rotating said turret and work pieces thereon; and

closing said blow and injection molds;

the improvement comprising sequentially:

opening said blow mold by moving said moveable blow mold half to said open position before opening said injection mold;

placing a label in said moveable blow mold half while previously blown and labeled work pieces remain in said lower, work piece operating work piece position and said turret remains in said lower, work piece operating turret position;

releasably securing said label in said moveable blow mold half;

opening said parison mold by moving said moveable parison mold half to said open position, while simultaneously moving said turret from said lower, work piece operating turret position to said rotating position and removing previously blown and labeled work pieces from said lower, work piece operating work piece position;

moving said blow molded work pieces to said successive work station by rotating said turret; and

moving said turret from said rotating position to said lower work piece operating turret position and closing said blow and injection molds;

whereby said machine is adapted to permit insertion of said labels into said blow mold before previously blown and labeled work pieces are moved from said lower, work piece operating work piece position without increasing overall machine cycle time.

4,983,349

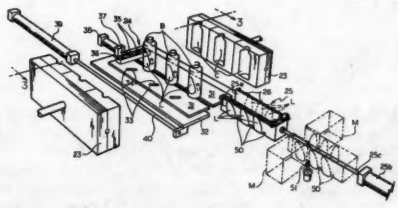
APPLYING LABELS TO BLOW MOLDED ARTICLES

Thomas J. Krall, Toledo, and Robert A. Myers, Perrysburg, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Division of Ser. No. 170,473, Mar. 21, 1988, Pat. No. 4,854,848. This application Jun. 27, 1989, Ser. No. 372,391

Int. Cl.[5] **B29C** *49/24*

U.S. Cl. 264—509 **3 Claims**



1. In a method for forming hollow blown plastic articles by blow molding parisons into conformity with cavities of a longitudinally spaced array of mold sections wherein parisons are extruded in the form of tubes into an array of neck molds on a head,

the head is moved axially away from the extruder to define the parisons,

the array of mold sections are closed about the parisons,

the parisons are blown outwardly to form hollow blown articles, and the blown articles are grasped by a take out mechanism and the mechanism is reciprocated generally horizontally in a first direction away from and a second direction toward said molds after the mold sections are opened,

the improvement for applying labels to the hollow blown plastic articles comprising

positioning a label carrier having an array of spaced vacuum pick up devices movably supported on said carrier

mounted adjacent said molds for reciprocating movement generally horizontally in said first direction past a source of labels, at which the array of vacuum devices are actuated to pick up labels, to a position between the open mold sections and in said second direction generally horizontally away from said molds and toward the sources of labels,

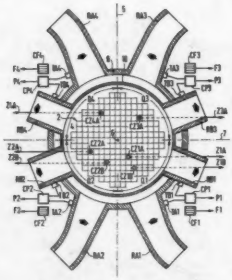
and moving the carrier in a reciprocating movement in said first direction to a position between the longitudinally spaced array of mold sections substantially at the same time as the take out mechanism is moved in said second direction adjacent the mold sections to grasp the blown articles and then moving the take out mechanism in said first direction to remove said blown articles as the labels are being applied to the array of cavities of the mold sections so that the labels are delivered with substantially no delay in cycle time such that the vacuum devices can be actuated to deliver the labels to the cavities of the array of open mold sections.

4,983,350

METHOD AND APPARATUS FOR DETECTING THE FALL OF A CONTROL CLUSTER IN A NUCLEAR REACTOR

Francois Foret, Courbevoie, France, assignor to Framatome, Courbevoie, France

Filed Jun. 8, 1989, Ser. No. 364,352
Claims priority, application France, Jun. 8, 1988, 88 07622
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—245 **5 Claims**



1. Apparatus for detecting the fall of a control cluster into the core of a nuclear reactor, said core comprising a plurality of zones (Q1, Q2, Q3, Q4) each (Q1) provided with:

heat measurement means (T1A, T1B, CP1) for providing a heat flux signal (P1) corresponding to said zone and representative of heat flux removed by the flow of a cooling fluid through said zone;

neutron measuring means (CF1) for providing a neutron flux signal (F1) corresponding to said zone and representative of nuclear power in said zone; and

a plurality of control clusters, with each of said control clusters being provided with measurement means (CZ1A, CZ1B, . . .) for providing a cluster position signal (Z1A, Z1B, . . .) representative of the position of said cluster;

said apparatus comprising differentiation and comparison means (12) for receiving "sensitive" signals sensitive to the displacements of the control clusters and for providing corresponding alarm signals whenever said sensitive signals vary at a rate greater than corresponding predetermined alarm thresholds; and

logical processor means for providing a cluster fall signal in the presence of a plurality of said alarm signals;

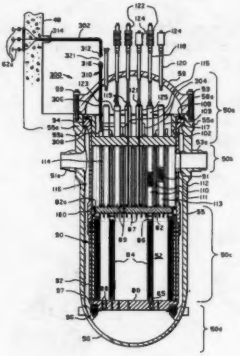
said apparatus being characterized by the fact that said alarm signals include at least signals of a first tYpe and of a second type, said first type being constituted by position alarm signals (Z'1A, Z'1B, . . . , Z'2A, Z'2B, . . . , Z'3A, Z'3B, . . . , Z'4A, Z'4B, . . .) corresponding to said cluster position signals (Z1A, Z1B, . . . , Z2A, Z2B, . . . , Z3A, Z3B, . . . , Z4A, Z4B, . . .) and a second type being constituted by heat alarm signals (P'1, P'2, P'3, P'4) corresponding to said heat flux signals (P1, P2, P3, P4) and/or by neutron alarm signals (F'1, F'2, F'3, F'4) corresponding to said neutral flux signals (F1, F2, F3, F4), said logic processing means (L1, L2, L3, L4, 14, 18, 22) providing said cluster fall signal (24) on receiving at least two of said alarm signals including at least one of said position alarm signals.

4,983,351

TOP HEAD PENETRATION, HYDRO-BALL IN-CORE INSTRUMENTATION SYSTEM

Stephen N. Tower, Washington Township, Westmoreland County; Luciano Veronesi, O'Hara Township, Alleheny County, and Howard E. Braun, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 42,183, Apr. 24, 1987. This application May 1, 1989, Ser. No. 345,864
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—254 **6 Claims**



1. In a nuclear reactor pressure vessel having an outer enclosure defined by a generally cylindrical sidewall with a generally vertical central axis and upper and lower edges, and top and bottom heads secured in sealed relationship to the upper and lower edges, respectively, of the cylindrical sidewall, and the vessel enclosing therein a core including a plurality of elongated fuel element assemblies mounted in parallel axial relationship between vertically spaced lower and upper core support plates supported at respective, lower and intermediate, vertically spaced positions of the cylindrical sidewall of the vessel and an upper internals support plate supported within and adjacent the upper end of the cylindrical sidewall of the vessel, an instrumentation system comprising:

plural instrumentation thimbles, each of elongated and generally cylindrical sidewall configuration and defining an elongated interior passageway of a predetermined, fixed diameter, and having an open, upper end, a closed, lower end and having flow holes in the sidewall adjacent the lower end, said thimbles being disposed in generally parallel axial relationship centrally within respective fuel element assemblies and thus at predetermined positions intermediate the upper and lower core support plates;

plural bores in the upper core support plate in alignment with the respective, plural instrumentation thimbles;

plural head penetrations and associated, plural head penetration columns, each said head penetration being of generally elongated, cylindrical configuration and extending in

parallel axial relationship through the top head of the vessel and in sealed relationship therewith and having a first, lower end within the interior of the vessel top head and a second, upper end exterior of the vessel top head;

each of said plural head penetration columns being of generally elongated, cylindrical configuration and correspondingly having a cylindrical sidewall and a first, lower end and a second, upper end;

means for supporting the first, lower ends of said head penetration columns on the upper internals support plate, said head penetration columns extending in parallel axial relationship through said respective head penetrations and said second, upper ends thereof being disposed above the second, upper ends of the respective head penetrations;

means for mechanically securing each said head penetration column to its associated head penetration and for sealing the head penetration column to the second, upper end of said associated, head penetration;

plural detector guide tubes, each defining an interior passageway, as aforesaid, extending from the upper end of an associated head penetration column and passing therewith through the respectively associated head penetration and into the interior of said upper head and through the sidewall of the penetration column to respective, said predetermined positions and correspondingly aligned with respective said instrumentation thimbles;

said upper internals support plate further comprising a plurality of bores positioned in alignment with said predetermined positions and respectively associated instrumentation thimbles;

plural elongated, generally cylindrical column tubes defining respective interior passageways therethrough, as aforesaid, each extending through a respective bore in said upper internal support plate and having a first upper end at said predetermined position and a second lower end disposed adjacent the open, upper end of an associated instrumentation thimble;

plural first means connecting corresponding said detector guide tubes to said first upper ends of said respective column tubes; and

plural second means connecting said second, lower ends of said column tubes to said respective, open and upper ends of said instrumentation thimbles.

4,983,352

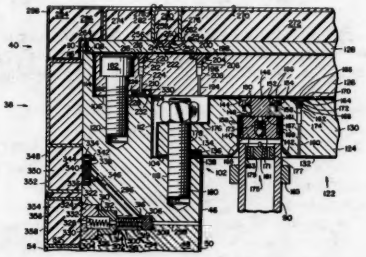
CLOSURE SYSTEM FOR A SPENT FUEL STORAGE CASK

Larry E. Efferding, Pensacola, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 670,727, Nov. 13, 1984, abandoned. This application Nov. 24, 1989, Ser. No. 442,434

Int. Cl.[5] G21C *17/00*

U.S. Cl. 376—272 **21 Claims**



11. A cask closure system, comprising;

a cask base element having a stepped mouth region communicating with a hollow interior for storing spent nuclear fuel, said stepped mouth region having a first horizontal portion and a second horizontal portion disposed above said first horizontal portion, said cask base element additionally having a cavity therein extending from outside of said base elemenet, a first gas passage communicating between said cavity and the interior of said cask, and a second gas passage communicating between the cavity and the outside of said base element,

lid assembly means for closing said mouth region, said lid assembly means including a shield lid having a peripheral region positioned on said first horizontal portion, means for attaching said sheild lid to said mouth region, and means contacting both said shield lid and said first horizontal portion for providing a gas seal, said lid assembly means additionally including a primary cover disposed above said shield lid and having a peripheral region positioned on said second horizontal portion, means for attaching said primary cover to said mouth region, and means contacting both said primary cover and said second horizontal portion for providing a primary gas seal to prevent gas from the interior of the cask from escaping to the exterior, wherein said primary cover has a third gas passage inward of said primary gas seal to receive gas injected between said shield lid and said primary cover to test said primary gas seal and a fourth gas passage outward of said primary gas seal to receive any gas that has leaked through said primary gas seal during the test so that the leakage gas can be detected;

pressure monitoring means mounted within said cavity for sensing gas pressure via said first gas passage and for receiving gas for recalibrating said pressure monitoring means via said second gas passage;

means for sealing said cavity; and

means for sealing said second gas passage.

4,983,353

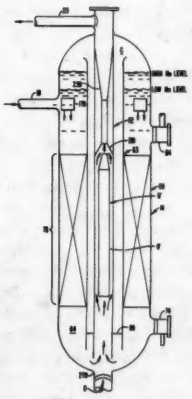
NOVEL PASSIVE APPROACH TO PROTECTING THE PRIMARY CONTAINMENT BARRIER FORMED BY THE INTERMEDIATE HEAT EXCHANGER FROM THE EFFECTS OF AN UNCONTROLLED SODIUM WATER REACTION

Charles E. Boardman, Saratoga, and John P. Maurer, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 13, 1989, Ser. No. 322,481

Int. Cl.[5] G21C *9/00*; F28D *7/00*

U.S. Cl. 376—283 **6 Claims**



4. In combination:

a sodium reactor having a core for said reactor defining a primary sodium loop and a secondary sodium loop;

an intermediate heat exchanger located within said sodium reactor;

first pumping means for pumping sodium in said primary sodium loop through said core through said intermediate heat exchanger and through said pump in an endless loop for carrying the heat of said core to said intermediate heat exchanger;

a steam generator, said steam generator for receiving non-radioactive liquid sodium from the intermediate heat exchanger of said sodium cooled reactor and generating steam for producing power;

second pumping means for pumping sodium in said secondary loop from said intermediate heat exchanger and through said steam generator;

said steam generator including first and second concentric upstanding cylindrical vessels;

said first upstanding cylindrical vessel being exterior, and larger than said second cylindrical vessel, said first cylindrical vessel closed at the top to define a gas plenum overlying the top of said sodium and closed at the bottom to provide a sodium plenum;

a sodium inlet defined at the top of said first vessel for supplying heated sodium from the secondary loop in said sodium reactor into an interstitial volume between the inside of said first vessel and the outside of said second vessel;

a sodium outlet communicated from the bottom of said first cylindrical vessel for the discharge of sodium back to said intermediate heat exchanger in said secondary sodium loop;

said second cylindrical vessel being interior of and smaller than said first cylindrical vessel, said second cylindrical vessel open to the bottom of said first cylindrical vessel at said sodium plenum and defining at the top an opening to gas plenum within said first cylindrical vessel;

at least one inlet feedwater plenum at the bottom of said first cylindrical vessel communicated to the interstitial volume between said first cylindrical vessel and said second cylindrical vessel;

at least one steam outlet plenum at the top of said first cylindrical vessel communicated to the interstitial volume between said first cylindrical vessel and said second cylindrical vessel;

a plurality of tubes communicated to said feedwater inlet plenum at the bottom of said steam outlet plenum, said tubes being coiled in the interstitial volume between said first and second upstanding cylindrical vessels;

a standing head of sodium in the interior of said second upstanding cylindrical vessel, said standing head of sodium supported by sodium pressure at said lower plenum; and

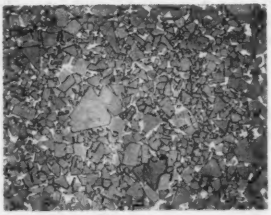
a rupture diaphragm defined at the bottom plenum of said steam generator means for relieving pressure and flow from an explosive reaction at said tubes through said second vessel for opening and rupturing said rupture diaphragm along a path independent of said tubes whereby reactives and the continuing steam and feedwater flow from broken tubes in said steam generator can pass through the volume interior of said second cylindrical vessel to said rupture diaphragm without causing the sodium-steam interface to be forced back into said intermediate heat exchanger of said reactor.

4,983,354

UNIFORM COARSE TUNGSTEN CARBIDE POWDER AND CEMENTED TUNGSTEN CARBIDE ARTICLE AND PROCESS FOR PRODUCING SAME

David A. Reeder, Sayre; Carlos Lopez, and Jack L Burwick, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 10, 1989, Ser. No. 308,507
Int. Cl.[5] B22F *3/00*
U.S. Cl. 419—11 **3 Claims**



1. A process for producing tungsten carbide powder, said process comprising:

(a) deagglomerating tungsten powder and thereafter classifying said tungsten powder to produce a deagglomerated and classified tungsten powder wherein the average particle size as measured by Fisher Subseive Size is greater than about 20 micrometers in diameter and wherein essentially no particles are greater than about two and one-half times larger than the average Fisher Subsieve Size;

(b) forming a uniform first mixture of said deagglomerated and classified tungsten powder and carbon wherein the amount of said carbon is sufficient to react with essentially all of said tungsten to produce tungsten carbide in the subsequent heating step;

(c) heating said first mixture at a temperature of from about 1425° to about 2000° C. for a sufficient time in a reducing atmosphere to produce tungsten carbide powder; and

(d) deagglomerating and thereafter classifying said tungsten carbide powder to eliminate essentially all particles that are greater than about two and one-half times the average Fisher Subseive Size value and to produce a tungsten carbide powder wherein the average particle size is greater than about 20 micrometers in diameter and wherein there are essentially no particles that are less than about one-half of the average particle size and wherein there are essentially no particles that are greater than about two and one-half times the average particle size of said tungsten carbide powder.

4,983,355

SEAL ELEMENT OF HARD MATERIAL SINTERED FROM A SEMI-FINISHED FORM WITH ORGANIC BINDER

R. Knapp Alfons, Biberach/Riss, Fed. Rep. of Germany, assignor to Masco Corporation of Indiana, Indianapolis, Ind.

Division of Ser. No. 297,279, Jul. 15, 1988. This application Oct. 2, 1989, Ser. No. 414,965
Claims priority, application Italy, Dec. 3, 1986, 67899 A/86
Int. Cl.[5] B22F *3/00*
U.S. Cl. 419—26 **18 Claims**

1. A process for manufacturing a seal element of hard material comprising the steps of:

molding a semi-finished seal form from a mixture made from a fine powder of hard material destined to constitute the seal element and an organic binder selected from the group consisting of a plastic material, a wax material, and a mixture of wax and plastic materials;

applying a precise finish to said molded semi-finished seal form; and

sinterizing said seal form.

4,983,356

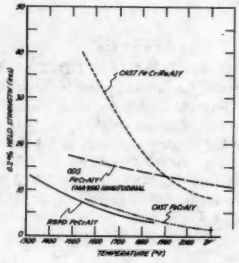
RUTHENIUM BEARING IRON BASE HIGH TEMPERATURE STRUCTURAL ALLOYS

Melvin R. Jackson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 208,905, Jun. 20, 1988, abandoned. This application Jul. 31, 1989, Ser. No. 386,744

Int. Cl.[5] C22C *38/06*

U.S. Cl. 420—35 **5 Claims**



1. As a composition of matter an alloy containing the following ranges of concentration of ingredients:

Ingredient	Range of Concentrations in Atomic %	
	From about	To about
Iron	Balance	
Chromium	15	20
Ruthenium	4	20
Aluminum	16	30

4,983,357

HEAT-RESISTANT TIAL ALLOY EXCELLENT IN ROOM-TEMPERATURE FRACTURE TOUGHNESS, HIGH-TEMPERATURE OXIDATION RESISTANCE AND HIGH-TEMPERATURE STRENGTH

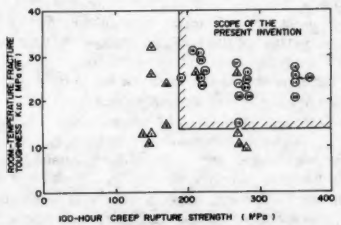
Shinji Mitao; Seishi Tsuyama, and Kuninori Minakawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,360

Claims priority, application Japan, Aug. 16, 1988, 63-203455

Int. Cl.[5] C22C *14/00, 30/00*

U.S. Cl. 420—418 **25 Claims**



1. A TiAl heat-resistant alloy excellent in a room-temperature fracture toughness, a high-temperature oxidation resistance and a high-temperature strength, consisting essentially of:

aluminum	from 29 to 35 wt. %,

-continued

niobium	from 0.5 to 20 wt. %,

at least one element selected from the group consisting of:

silicon	from 0.1 to 1.8 wt. %,
and	
zirconium	from 0.3 to 5.5 wt. %,

and

the balance being titanium and incidental impurities.

4,983,358

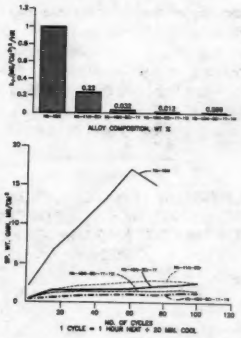
NIOBIUM-ALUMINUM BASE ALLOYS HAVING IMPROVED, HIGH TEMPERATURE OXIDATION RESISTANCE

Mohan G. Hebsur, North Olmsted, and Joseph R. Stephens, Berea, both of Ohio, assignors to Sverdrup Technology, Inc., Tullahoma, Tenn.

Filed Sep. 13, 1989, Ser. No. 406,700

Int. Cl.[5] C22C *27/00, 21/04*

U.S. Cl. 420—425 **5 Claims**



1. An oxidation resistant, niobium-aluminum base alloy consisting essentially in amounts by weight of about 48–52% niobium, 36–42% aluminum, 4–10% chromium, 0–2% silicon and/or tungsten, 0.1–2.0% of a rare earth selected from the group consisting of yttrium, ytterbium and erbium.

4,983,359

APPARATUS FOR MEASURING LYMPHOCYTE SUBCLASSES

Atsuo Tomioka, Chatsworth, Calif.; Hiroyuki Harada, and Keiichi Inami, both of Hyogo, Japan, assignors to TOA Medical Electronics Co., Ltd., Kobe, Japan

Filed Sep. 14, 1987, Ser. No. 95,894

Claims priority, application Japan, Feb. 10, 1987, 62-28945

Int. Cl.[5] G01N *21/00, 33/00, 33/533*

U.S. Cl. 422—81 **2 Claims**

1. An apparatus for measuring lymphocyte subclasses comprising:

(a) automatic staining means for mixing and reacting a fluorescently tagged monoclonal antibody with a blood sample;

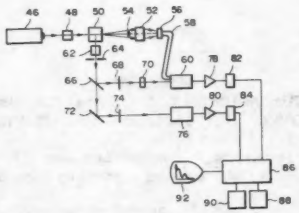
(b) a sensing station of a flow cytometer including a flow cell through which the stained sample is passed;

a laser light source for irradiating with laser light the stained sample as it is passed through the flow cell of said sensing station;

a single photosensor for sensing first scattered light scattered

by each cell of the sample in a direction substantially parallel to the optical axis of the laser light, and second scattered light scattered by each cell of the sample in a direction perpendicular to the optical axis of the laser light, said photosensor being located downstream of the irradiation of the cells passing through the flow cell;

a single fluorescent light sensor for sensing fluorescent light in a direction perpendicular to the optical axis of the laser light, said fluorescent light sensor being located downstream of the irradiation of the cells passing through the flow cell;



(c) data processing means for receiving and processing output signals from said scattered light photosensor and fluorescent light sensor to discriminate lymphocytes based on a distribution of signals indicative of the intensities of the first scattered light and the second scattered light; and

(d) display means for displaying data indicative of a lymphocyte subclass identified by said data processing means.

4,983,360

GALLIUM NITRIDE AND OXYNITRIDES USED AS SELECTIVE DETECTORS OF REDUCING GASES, PROCESS OF MAKING AND DEVICE CONTAINING THEM

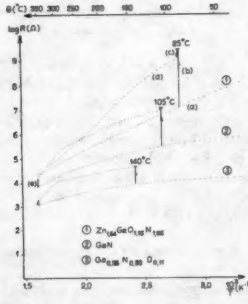
Odile Merdrignc, Lamballe; Jean Guyader; Patrick Verdier, obth of Acigne; Yves Colin, Yves Laurent, Both of Cesson-Sevigne, all of France, assignors Centre National De La Recherche Scientifique, Paris, France

Filed Nov. 1, 1989, Ser. No. 430,515

Claims priority, application France, Nov. 2, 1988, 8814270

Int. Cl.[5] H01C *7/00;* **G01N** *27/00, 27/04, 33/00*

U.S. Cl. 422—90 **9 Claims**



1. A compound for use with selective detectors of the semiconductor resistance type which selectively detect for nitrogenous reducing gases in the atmosphere, especially ammonia and gases containing NH and/or NH_2 groups, said compound comprising gallium nitride and oxynitrides of tetrahedral structure according to the general formula:

$$Ga_{1-\frac{x}{3}}\square_{\frac{x}{3}}N_{1-x}O_x$$

in which:

$\square$ represents a hole, and $0 \leqq \times \leqq 0.3$.

4,983,361

REACTOR PROVIDED WITH FLUIDIZED CHAMBER

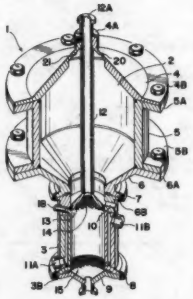
Yukitaka Shukunobe, Kawagoe; Tetsuo Nakamura, Iruma; Koji Aono, Tokyo; Ryoichi Doki, Sayama; Mamoru Kuwazuru, Kawagoe; Kouzou Shimoda, Tokyo, and Tomoe Yoshida, Tokorozawa, all of Japan, assignors to R&D Association for Bioreactor System, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,306

Claims priority, application Japan, Dec. 28, 1987, 62-336364

Int. Cl.[5] B01J *8/02, 8/20*

U.S. Cl. 422—145 **7 Claims**



1. A reactor for containing a bed of reactive solids and having a fluidized chamber associated therewith for periodic fluid treatment of the reactive solids, comprising:

(1) a generally vertically-disposed column chamber for containing the reactive solids;

(2) a first screen disposed near a lower end of the column chamber for supporting the reactive solids;

(3) a fluidized chamber of greater volume than the volume of said column chamber and being disposed generally above and in fluid communication with said column chamber at a fluid communicating juncture therebetween;

(4) a straight hollow interior inner tube extending from an upper portion of the fluidized chamber to near said juncture and terminating in a head portion;

(5) a head opening in said head portion in fluid communication with the hollow interior of said inner tube;

(6) a second screen disposed over said head opening so that the reactive solids are containable in said column chamber between vertical inner walls of the column chamber and said first and second screens;

(7) means for allowing movement of said inner tube vertically upwardly until said head portion is near a top portion of said fluidized chamber; and

(8) means for introducing a washing fluid or the like into a bottom portion of the column chamber such as to wash reactive solids moved to the fluidized chamber;

and wherein said fluidized chamber has a configuration such that when said washing fluid is discontinued, reactive solids in said fluidized chamber settle into said column chamber.

4,983,362

PROCESS AND APPARATUS FOR CONTROLLED THERMAL AFTERBURNING OF A PROCESS EXHAUST GAS CONTAINING OXIDIZABLE SUBSTANCES

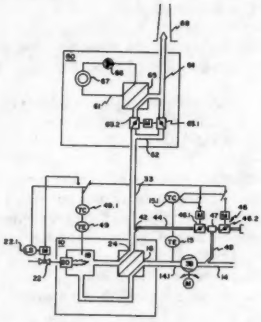
Herbert J. Obermüller, Linsengericht-Grossenhausen, Fed. Rep. of Germany, assignor to Grace GmbH, Norderstedt, Fed. Rep. of Germany

Division of Ser. No. 14,030, Feb. 12, 1987, Pat. No. 4,820,500. This application Mar. 22, 1989, Ser. No. 326,996

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605415

Int. Cl.[5] F01N *3/30*

U.S. Cl. 422—173 6 Claims



1. Apparatus for the controlled afterburning of process exhaust gas containing oxidisable substances, comprising a housing having: a gas inlet means; burner means having a portion projecting into said housing; a high velocity mixing pipe generally coaxial with and in flow communication with the burner portion projecting into said housing; a combustion chamber; a heat exchanger with heat exchanger tubes fitted concentrically to the high velocity mixing pipe; and a gas outlet, wherein external to said housing there is provided between the gas outlet and the gas inlet, means for recirculating at least a portion of purified process exhaust gas, and means for introducing fresh air into the process exhaust gas containing oxidisable substances being fed to the gas inlet of the housing for simultaeously maintaining the temperature of gas entering the combustion chamber and the concentration of oxidisable substances in the combustion chamber at a constant value.

4,983,363

APPARATUS FOR PURIFYING ARSINE, PHOSPHINE, AMMONIA, AND INERT GASES TO REMOVE LEWIS ACID AND OXIDANT IMPURITIES THEREFROM

Glenn M. Tom, New Milford, and Duncan W. Brown, Wilton, both of Conn., assignors to Advanced Technology Materials, Inc., New Milford, Conn.

Division of Ser. No. 29,632, Mar. 24, 1987, Pat. No. 4,761,395. This application Mar. 3, 1988, Ser. No. 163,792

Int. Cl.[5] B01J *8/02, 31/06*

U.S. Cl. 422—180 19 Claims

1. An apparatus for purifying a gaseous mixture comprising (i) a primary component selected from the group consisting of arsine, phosphine, ammonia, inert gases, and mixtures thereof, and (ii) impurities selected from the group consisting of Lewis acids, oxidants, and mixtures thereof, comprising:

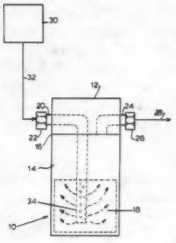
(a) a vessel containing a bed of a scavenger, the scavenger comprising:

(1) a support having a surface area in the range of from about 50 to about 1000 square meters per gram of support; and

(2) associated with, but not covalently bonded to, said support, an anion which is reactive to effect the removal of said impurities from said gaseous mixture, said anion being selected from the group consisting of:

(A) carbanions whose corresponding protonated compounds have a pK_a value of from about 22 to about 36;

(B) anions formed by reaction of said carbanions with the primary component of said mixture; and



(C) mixtures thereof;

(b) means for introducing the mixture to said vessel for passage through said bed therein; and

(c) means for discharging impurity-depleted mixture from said vessel.

4,983,364

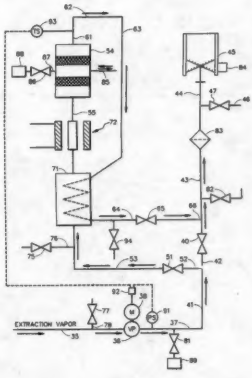
MULTI-MODE COMBUSTOR

F. A. Mackinnon Buck, 4058 Southview Dr., San Diego, Calif. 92117; Detlev E. M. Hasselmann, 519 S. Nardo Ave., Solana Beach, Calif. 92075, and Paul D. Labonte, 9371 Fermi Ave., San Diego, Calif. 92123

Filed Jul. 17, 1987, Ser. No. 74,685

Int. Cl.[5] B01J *8/02*

U.S. Cl. 422—189 34 Claims



1. Multi-mode oxidation apparatus for cleansing air contaminated by volatile organic compounds (VOC) in an exothermic reaction, said apparatus comprising:

a source of air contaminated by VOC of uncontrolled and varying concentrations;

conduit means connected to said source of the VOC contaminated air;

thermal combustion means having an input for the VOC contaminated air and an exhaust to atmosphere of carbon dioxide and water vapor;

a catalytic oxidizer having an input port for the VOC con-

taminated air and an exhaust to atmosphere of carbon dioxide and water vapor; and

means for selectively coupling said conduit means to said thermal combustion means input and to said catalytic oxidizer input port, depending on the concentration of VOC in the input VOC contaminated air.

4,983,365

DESULPHURIZATION

Patrick J. Denny, Darlington, and Peter J. H. Carnell, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 188,104, Apr. 27, 1988, abandoned, which is a continuation of Ser. No. 386, Jan. 5, 1987, abandoned. This application Nov. 2, 1989, Ser. No. 430,947

Int. Cl.[5] C01B *17/04*

U.S. Cl. 423—230 **11 Claims**

1. A method of removing hydrogen sulphide from a liquid or gaseous feedstock containing hydrogen sulphide as an impurity wherein the feedstock is passed through a bed of a desulphurising absorbent consisting essentially of zinc oxide and having a surface area above 20 m^2g^{-1}, at a temperature in the range −10° to +200° C.,

and temporarily, for a period of 1 hour to 1 day, increasing the temperature of the absorbent bed from said temperature in the range −10° to +200° C. by at least 50° C. to a temperature not in an excess of 300° C.

4,983,366

METHOD FOR THE CATALYTIC CONVERSION OF WASTE GASES CONTAINING HYDROCARBON, HALOGENATED HYDROCARBON AND CARBON MONOXIDE

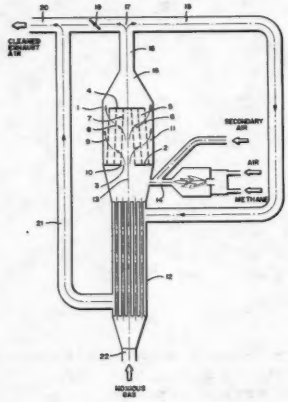
Klaus Deller, Hainburg; Hans Moesinger, Rodenbach; Herbert Mueller, Karlstein a. Main; Josef Riedel; Wenzel Kuehn, both of Burgkirchen, and Rudolf Spielmannleitner, Altoetting, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 21, 1988, Ser. No. 247,297

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1987, 3731688

Int. Cl.[5] B01D *53/36*

U.S. Cl. 423—240 **11 Claims**



1. A method for the catalytic conversion of waste gases containing hydrocarbons, halogenated hydrocarbons and carbon monoxide, comprising passing said waste gases at 300°–800° C., in a first step through a first zone containing a catalyst for oxidative cracking and then through a second zone containing a catalyst for oxidative afterburning, wherein the catalytically active substance of the catalyst of the first zone is aluminum oxide, silicon dioxide, aluminum silicate and/or a zeolite, said catalyst in the first zone also contains 0.1–20% by weight of oxide compounds of Ba, Mg or Ba and Mg, and wherein the catalytically active substance of the catalyst of the second zone is platinum, palladium, platinum and palladium, or platinum and rhodium.

4,983,367

SULPHUR COMPOUNDS REMOVAL

Patrick J. Denny, Darlington, and Peter Wood, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 39,070, Apr. 16, 1987, Pat. No. 4,871,710. This application Aug. 24, 1989, Ser. No. 398,382

Claims priority, application United Kingdom, Apr. 25, 1986, 8610196

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.[5] B01J *8/00*; C01B *17/00, 17/16, 31/20*

U.S. Cl. 423—244 **4 Claims**

1. A process for the removal of sulphur compounds selected from the group consisting of hydrogen sulfide, mercaptans, and carbonyl sulfide from a fluid stream comprising passing said fluid through a bed of agglomerates having

a size in the range 1 to 10 mm;

a BET surface area of at least 80 $m^2.g^{-1}$;

a calcined density of not more than 1.5 $g.cm^{-3}$; and comprising

(a) at least one copper compound and at least one zinc compound; and

(b) at least one element X compound, wherein element X is selected from aluminum, silicon, and metals of Groups IIIA, IVA, VA, VIA, and VIIA of the Periodic Table,

and wherein said at least one copper, zinc and element X compounds are in the form of oxides, hydroxides, carbonates and/or basic carbonates; and

said at least one copper, zinc, and element X compounds are in such proportions that

(i) the copper atoms in said copper compound form at least 30% the zinc atoms in said zinc compound form at least 5%, and the element X atoms in said element X compound form 5–20%

of the total number of copper, zinc and element X atoms in said agglomerates; and

(ii) after ignition of said agglomerates at 900° C. thereby forming an ignited composition consisting of the constituents of said agglomerates in oxide form, the cupric oxide plus zinc oxide content of the ignited composition is as least 70% by weight.

4,983,368

METHOD OF PRODUCING β-SIALON FINE POWDER

Michitaka Sato; Keiji Watanabe, and Hiroaki Nishio, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,013

Claims priority, application Japan, Dec. 23, 1988, 63-323617

Int. Cl.[5] C01B *33/26, 21/068, 33/06*; C04B *35/58*

U.S. Cl. 423—327 **9 Claims**

1. A method of producing a β-sialon powder which comprises using a silane compound represented by the general formula of SiH_xCl_{4-x} ($0 \leqq x \leqq 4$) as a Si source, $AlCl_3$ as an Al source and an ether represented by the general formula of ROR′ ($R,R' = C_yH_{2y+1}$, $1 \leqq y \leqq 5$) as an oxygen source respectively, dissolving them in an organic solvent capable of dissolving them to obtain a solution, introducing ammonia gas into the solution to produce coprecipitate, and burning the coprecipitate in a nonoxidative atmosphere.

4,983,369

PROCESS FOR FORMING HIGHLY UNIFORM SILICA SPHERES

Timothy J. Barder, Addison, and Philip D. DuBois, Lisle, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 22, 1989, Ser. No. 440,541
Int. Cl.[5] C01B *33/12*; B01J *35/08*
U.S. Cl. 423—338 **22 Claims**

1. A process for producing microspheres of silica having a uniform size between 0.1 and 10 μm diameter comprising:

(a) combining a hydrolyzable silica precursor, an alcohol, ammonia, and water in proportions such that two liquid phases would form and wherein the combined composition is 20–50 wt.% hydrolyzable silica precursor, 5–30 wt.% alkanol, 40–70 wt.% water and 5–10 wt.% ammonia,

(b) forming microspheres by hydrolysis of said silica precursor in the mixture of (a),

(c) recovering the microspheres formed in (b).

4,983,370

PURIFIED QUARTZ AND PROCESS FOR PURIFYING QUARTZ

Kenneth B. Loritsch, and Robert D. James, both of Asheville, N.C., assignors to The Feldspar Corporation, Spruce Pine, N.C.

Filed Feb. 6, 1990, Ser. No. 475,595
Int. Cl.[5] C01B *33/12*
U.S. Cl. 423—340 **9 Claims**

1. A process for purifying quartz crystals from quartz raw materials that contain surface bound impurities and interstitial alkali metal impurities, which comprises (1) subjecting the quartz raw materials to a treatment which removes substantially all of the surface bound impurities to yield treated quartz crystals "which comprises two cycles of selective flotation, magnetic separation and at least one HF aqueous leach, followed by subjecting the treated quarts crystals to a vapor containing HCl gas at a temperature of 800 to 16500° C. to diffuse the interstitial alkali metal impurities to the surface of the treated quartz crystals to yield purified quartz crystals, and (3) recovering the purified quartz crystals.

4,983,371

SILICON NITRIDE POWDER OF LOW OXYGEN CONTENT

Ulrike Pitzer; Benno Laubach, and Gerhard Franz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 21, 1989, Ser. No. 396,328
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829503
Int. Cl.[5] C01B *21/68*; C04B *35/58*
U.S. Cl. 423—344 **3 Claims**

1. Si_3N_4 powder wherein the total oxygen content of the powder is 0.4% by weight or less.

4,983,372

PROCESS FOR PREPARING HALIDE-FREE RHODIUM NITRATE

Walter C. Brienza, 494 Ivy La., Wyckoff, N.J. 07481

Filed Jul. 20, 1990, Ser. No. 555,233
Int. Cl.[5] C01G *55/00*
U.S. Cl. 423—395 **10 Claims**

1. A process for preparing halide-free rhodium nitrate which comprises:

(a) reacting rhodium metal with concentrated hydrochloric acid, gaseous chlorine and gaseous hydrogen chloride under conditions which result in quantitative conversion of the rhodium metal to hexachlororhodic acid.

(b) reacting the resulting hexachlororhodic acid with potassium iodide to form rhodium iodide, and

(c) reacting said rhodium iodide with nitric acid and hydrogen peroxide to produce halide-free rhodium nitrate.

4,983,373

PROCESS FOR THE PRODUCTION OF HIGH PURITY ZIRCONIUM TETRAFLUORIDE AND OTHER FLUORIDES

Howard P. Withers, Jr., Fleetwood; Andrew J. Woytek, Allentown, and John T. Lileck, Tamaqua, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 23, 1988, Ser. No. 276,271
Int. Cl.[5] C01F *7/50*; C01G *25/04, 27/04*
U.S. Cl. 423—489 **17 Claims**

1. A process for producing metal fluorides for low optical loss glass applications selected from the group consisting of aluminum trifluoride, hafnium tetrafluoride and zirconium tetrafluoride, comprising the steps of:

(a) incompletely reacting reactants of a fluorinating agent selected from the group consisting of F_2, NF_3, N_2F_2, N_2F_4, ClF_3, BrF_3, IF_5 and SF_4 and a metal selected from the group consisting of aluminum, hafnium and zirconium, or the corresponding metal's compound to produce a reaction product comprising the metal fluoride and at least an amount of the residual metal or its compound effective to react with any metal fluoride impurities in the reactants, and

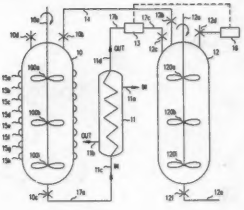
(b) separating the metal fluoride from the reaction product by heating the reaction product to selectively vaporize the metal fluoride for separate recovery from the reaction product and to react the residual metal or its compound with said metal fluoride impurities.

4,983,374

METHODS FOR FORMING TITANIUM CALCIUM OXIDE AND ZIRCONIUM CALCIUM OXIDE

Dieter Krijgsman, 10, Groteweg, 8191JW - Wapenveld, Netherlands

Continuation of Ser. No. 164,745, Mar. 7, 1988, abandoned, which is a division of Ser. No. 887,753, Jul. 18, 1986, Pat. No. 4,753,787. This application Aug. 15, 1989, Ser. No. 394,286
Int. Cl.[5] C01G *23/04, 25/02*
U.S. Cl. 423—593 **10 Claims**



1. A method of forming titanium calcium oxide comprising the steps of:

mixing reaction constituents comprising titanium hydroxide an calcium hydroxide with water in an autoclave in a stoichiometric ratio;

reacting said reaction constituents in said autoclave for a time and at a pressure to form in said autoclave non-gaseous reaction products and gas under pressure;

equalizing the pressure in a receiving vessel with the pressure in said autoclave by transferring a part of said gas from said autoclave to said receiving vessel until the pressure in said receiving vessel equals the pressure in said autoclave at which time the gas transfer is stopped;

dropping the pressure in said receiving vessel beneath the pressure in said autoclave after the transfer of gas from said autoclave to said receiving vessel is stopped; and

transferring, once the pressure in said receiving vessel has dropped beneath the pressure in said autoclave, the reaction products from said autoclave to said receiving vessel while maintaining the pressure in said receiving vessel beneath the pressure in said autoclave.

4,983,375

HEMATOLOGICAL STAIN SYSTEM

Thomas Mauthner, Livonia, Mich., assignor to Cambridge Diagnostic Products, Inc., Ft. Lauderdale, Fla.

Filed Oct. 23, 1989, Ser. No. 425,126
Int. Cl.[5] G01N *1/00, 1/30*
U.S. Cl. 424—3 **19 Claims**

1. An improved hematological stain comprising Wright's stain powder and a thiazole dye.

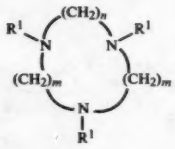
4,983,376

TRIAZAMACROCYCLIC NMR CONTRAST AGENTS AND METHODS FOR THEIR USE

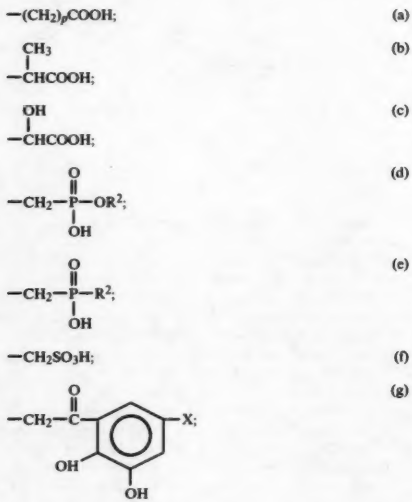
A. Dean Sherry, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 7,729, Jan. 27, 1987, which is a continuation-in-part of Ser. No. 662,075, Oct. 18, 1984, Pat. No. 4,639,365. This application Dec. 28, 1988, Ser. No. 291,053
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[5] A61K *49/00*; C07D *255/02*
U.S. Cl. 424—9 **18 Claims**

1. An NMR contrast agent, comprising a complex of a paramagetic metal selected from the group consisting of gadolinium, manganese, iron, and chromium, with a ligand selected from the group consisting of compounds having the formula



where R^1 is selected from the group consisting of:



$-(CH_2)_pCOOH$; (a)

(b)

(c)

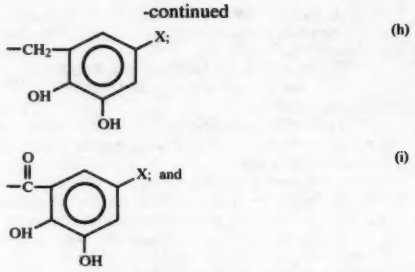
(d)

(e)

$-CH_2SO_3H$; (f)

(g)

-continued



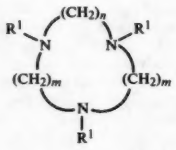
(h)

(i)

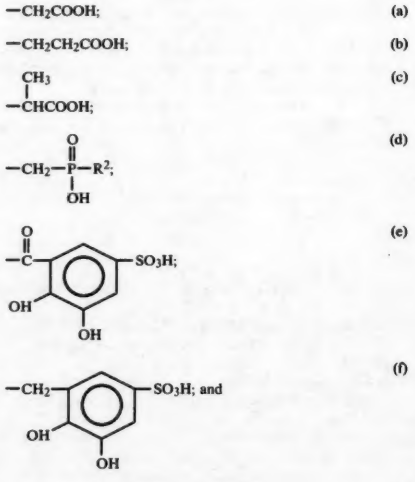
salts of any of the above groups (a)–(i); (j)

where R^2 is $-C_qH_{2q+1}$; X is selected from the group consisting of $-SO_3H$, $-COOH$, and salts thereof; n is 2–3; m is 2–3; p is 1–10; and q is 1–18.

18. A method of enhancing NMR contrast in a living subject, including administering internally to the subject an effective amount of a contrast agent which comprises a complex of gadolinium with a ligand selected from the group consisting of compounds having the formula



where R^1 is selected from the group consisting of:



$-CH_2COOH$; (a)

$-CH_2CH_2COOH$; (b)

(c)

(d)

(e)

(f)

salts of any of the above groups (a)–(f); (g)

where R^2 is $-C_qH_{2q+1}$, n is 2–3, m is 2–3, p is 1–4, and q is 1–6.

4,983,377

SILICONE HAIRSPRAY COMPOSITIONS

Carolyn S. Murphy, Mason, Ohio, and Mark R. Prausnitz, Somerville, Mass., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1989, Ser. No. 429,894
Int. Cl.[5] A61K *7/00*
U.S. Cl. 424—47 **24 Claims**

1. A hair spray composition comprising:

(a) from about 0.05% to about 10.0% by weight of the composition, of a non-rigid silicone gum having a viscosity of from about 100,000 centistoke to about 300,000,000 centistoke, said gum having dispersed therein from about 0.01% to about 8.0%, by weight of the composition, of unsolubilized particulate matter which will not interact with the silicone gum;

(b) from about 0.05% to about 5.0% by weight of the composition of a hydrophobically-modified quaternary ammonium treated montmorillonite clay agent or mixtures thereof; and

(c) from about 20% to about 95% of a volatile carrier.

4,983,378

METHOD AND COMPOSITION FOR TREATING XEROSTOMIA

Francis W. Parnell, Ross, Calif., assignor to Parnell Pharmaceuticals, Inc., San Rafael, Calif.

Continuation of Ser. No. 275,124, Nov. 22, 1988, Pat. No. 4,938,963. This application Mar. 12, 1990, Ser. No. 192,608
The portion of the term of this patent subsequent to Jul. 2, 2007, has been disclaimed.
Int. Cl.[5] A61K *9/68, 35/78, 9/20*
U.S. Cl. 424—48 **18 Claims**

1. A chewing gum composition for treating xerostomia and alleviating the symptoms thereof, comprising:

(a) about 0.25 wt.% to 10 wt.% eriodictyon fluid extract;

(b) about 1.0 wt.% to 30 wt.% sweetener;

(c) a stimulator compound selected from the group consisting of citric acid, ascorbic acid, and mixtures thereof, in an amount effective to stimulate salivary gland secretion; and

(d) a gum base.

4,983,379

DENTAL PREPARATION, ARTICLE AND METHOD FOR STORAGE AND DELIVERY THEREOF

Hans A. Schaeffer, 18 Pallant Ave., Linden, N.J. 07036

Division of Ser. No. 64,880, Jun. 19, 1987, U.S. Pat. No. 4,849,213, which is a division of Ser. No. 745,993, June 17, 1985, U.S. Pat. No. 4,687,663, which is a continuation-in-part of Ser. No. 737,157, May 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 471,188, Mar. 1, 1983, U.S. Pat. No. 4,528,180. This application Jun. 20, 1989, Ser. No. 369,185
Int. Cl.[5] A61K *7/18, 7/20*
U.S. Cl. 424—52 **22 Claims**

1. A composition useful in combatting gum disease comprising:

(a) a non-neutralized gel component consisting essentially of about 0.1–10.0% of hydrogen peroxide; about 0.05–5.0% of acrylic acid copolymer cross-linked with polyallyl sucrose; about 2–80% of a polyol selected from the group consisting of glycerin, sorbitol, propylene glycol, polypropylene glycol, polyethylene glycol, an ethoxylated lower fatty alcohol, a propoxylated lower fatty alcohol and mixtures thereof; and purified water;

(b) a paste component comprising: (i) about 2–60% sodium bicarbonate; (ii) about 0–6% of a salt selected from the group consisting of NaCl, KCl, $MgCl_2$, $MgSO_4$, Na_2SO_4, and K_2SO_4; (iii) about 2–60% of a humectant selected from the group consisting of glycerin, sorbitol, polyethylene glycol, propylene glycol, polypropylene glycol, an ethoxylated lower fatty alcohol, a propoxylated lower fatty alcohol and mixture thereof; (iv) about 0.1–5% of a thickener stabilizer selected from the group consisting of cellulose gum, magnesium aluminum silicate and mixtures thereof; (v) about 1–30% of a stabilizing polishing agent selected from the group consisting of bentonite, titanium dioxide, silica, magnesium oxide and mixtures thereof; (vi) a fluorine-containing compound selected from the group consisting of NaF, KF, sodium monofluorophosphate, potassium monofluorophosphate, sodium fluorosilicate, sodium fluorozirconate and mixtures thereof, in an amount sufficient to yield about 200–3000 ppm of fluorine; and (vii) purified water; said paste component being combined with said gel component immediately prior to use.

4,983,380

COMPOSITION FOR TREATMENT OF TEETH AND METHOD OF USE

David K. Yarborough, 3705 Northcote Dr., Birmingham, Ala. 35223

Filed Sep. 11, 1989, Ser. No. 406,418
Int. Cl.[5] A61K *7/18, 7/20, 33/40*
U.S. Cl. 424—52 **19 Claims**

1. A composition of matter for oral application to the teeth and adjacent gingival tissues comprising:

(a) a predetermined amount of an active ingredient for the beneficial treatment of the teeth selected from the group of hydrogen peroxide and mixtures thereof with fluoride; and

(b) a gelatinous mucoprotectant water soluble sodium stearate gel for preventing irritation of the mucous membranes of the mouth by forming a hydrophobic coating thereon.

4,983,381

METHOD AND DEVICE FOR PRODUCING THE WHITENING OF LIVE TEETH WITH PATHOLOGICAL AND NORMAL COLORATIONS

Vicente M. Torres Zaragoza, Valencia, Spain, assignor to Futura Medical S.A., Spain

Filed Apr. 16, 1987, Ser. No. 39,628
Int. Cl.[5] A61C *5/04, 13/08*; A61K *7/20*
U.S. Cl. 424—53 **21 Claims**

1. A method for whitening a live tooth or for simultaneously whitening a plurality of live teeth, said tooth or teeth containing colorants which impart to the tooth or teeth a color or colors, said tooth or teeth having enamel and enamel tubules, said tubules containing water or water vapor, said method comprising acid engraving the enamel to open the enamel tubules and extracting the water or water vapor from the tubules, covering the tooth or teeth with a metallic plate having an absorbent material containing a chemical whitening agent so that the tooth or teeth is covered by the plate with the absorbent material in contact with the tooth or teeth, said whitening agent being effective to react with and destroy the colorants when activated, heating the plate to cause the whitening agent to be heated to a temperature sufficient to activate it, and causing said absorbent material to be pressed against the tooth or teeth so as to cause the activated whitening agent to be released into the tubules and to diffuse through the tubules to the enamel-dentine junction of the tooth or teeth whereby to react with and destroy the colorants and thereby to whiten the tooth or teeth.

4,983,382

COSMETIC PREPARATION INCORPORATING STABILIZED ASCORBIC ACID

James M. Wilmott, West Milford, N.J., and Alexander P. Znaiden, Sloatsburgh, N.Y., assignors to Avon Products, Inc., New York, N.Y.

Continuation of Ser. No. 7,025, Jan. 27, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 291,424
Int. Cl.[5] A61K *7/480*
U.S. Cl. 424—62 **10 Claims**

1. A stable composition for cosmetic use comprising: ascorbic acid,

a first co-solvent, and

a second co-solvent, said first co-solvent being water, said second co-solvent being an organic solvent, said first and second co-solvents being miscible with each other, said ascorbic acid being present in an amount by weight ranging from about 1% to about 10% and said water being present in an amount by weight ranging up to but no more than about 12%, said second co-solvent comprising the remainder of the composition and being selected from the group consisting of ethanol, N-propynol, isopropyl alcohol, methanol, propylene glycol, butylene glycol, hexylene glycol, glycerine, sorbitol (polyol), di-propylene glycol, polypropylene glycol, or mixtures thereof, said second co-solvent comprising up to but no more than about 90% of the total weight of the composition in which at least about 40% of the total weight of said composition is ethanol, wherein said ascorbic acid is rendered stable in said composition thereby permitting said composition to be topically applied to the skin for facilitating percutaneous absorption of said ascorbic acid relative to the skin effective to produce enhanced skin appearance benefits.

4,983,383

HAIR CARE COMPOSITIONS

Richard C. Maksimoski, Maineville, and Carolyn S. Murphy, Mason, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 274,218, Nov. 21, 1988, abandoned. This application Oct. 31, 1989, Ser. No. 427,213

Int. Cl.[5] **A61K** *7/075, 7/08, 7/11*

U.S. Cl. 424—70 **30 Claims**

1. A hair care composition comprising from about 0.05% to about 10.0% of a nonrigid silicone gum having a viscosity of from about 100,000 centistoke to about 300,000,000 centistoke; said gum having dispersed therein from about 0.01% to about 8.0%, by weight of the composition, of unsolubilized particulate matter which will not interact with the silicone gum.

4,983,384

N-ALKOXLATED ETHER 2-PYRROLIDONES AS CONDITIONING AGENTS

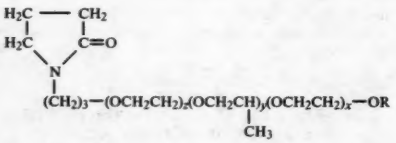
Anthony J. O'Lenick, Jr., 743 Ridgeview Dr., Lilburn, Ga. 30247

Continuation-in-part of Ser. No. 333,539, Apr. 5, 1989, Pat. No. 4,958,032. This application Jul. 11, 1990, Ser. No. 551,026

Int. Cl.[5] **A61K** *7/08;* **B05D** *3/02*

U.S. Cl. 424—70 **13 Claims**

1. A process of conditioning fiber which comprises contacting the fiber with an effective conditioning amount of a substituted lactam conforming to the following formula;



wherein;

R is a alkyl having from 10 to 36 carbon atoms;

x, y and z are independently integers from 0 to 50, with the proviso that the sum of x+y+z be greater than zero.

8. A process of claim 1 wherein the fiber is hair.

9. A process of claim 1 wherein the fiber is cellulosic.

10. A process of claim 1 wherein the fiber is polyester.

11. A process of claim 1 wherein the fiber is acrylic.

4,983,385

OINTMENT BASE

Kenji Hasegawa; Nakashima Nakashima; Toru Eguchi, and Ota Masako, all of Osaka, Japan, assignors to Sunstar Kabushiki Kaisha, Osaka and Lederle (Japan), Ltd., Tokyo, both of, Japan

Filed Sep. 29, 1988, Ser. No. 250,543

Int. Cl.[5] **A61K** *7/48*

U.S. Cl. 424—78 **7 Claims**

1. An ointment base for a wet body surface which comprises:

(a) a hydrogel formed by (i) a water-soluble polymer and a material selected from the group consisting of water, a polyhydric alcohol and (ii) a mixture thereof;

(b) a methacrylate copolymer selected from a group consisting of dimethylaminoethyl methacrylate/methyl methacrylate copolymer, ethyl methacrylate/chlorotrimethylammonium ethyl methacrylate copolymer or a mixture thereof; and

(c) a solubilizer which dissolves the methacrylate copolymer but is incompatible with water and the polyhydric alcohol,

a weight ratio of the methacrylate copolymer to the solubilizer being 1:2 to 1:25.

4,983,386

METHOD FOR INHIBITING THE DECREASE IN VISCOSITY OF GEL OINTMENT BASE AND OINTMENT

Takuzo Kamishita, Takatsuki; Takashi Miyazaki, Toyama, and Yoshihide Okuno, Namerikawa, all of Japan, assignors to Toko Yakuhin Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 139,806, Dec. 30, 1987. This application May 1, 1989, Ser. No. 346,541

Claims priority, application Japan, Jan. 14, 1987, 62-007044

Int. Cl.[5] **A61K** *31/74, 31/78*

U.S. Cl. 424—78 **5 Claims**

1. A method for inhibiting a decrease in viscosity of a gel ointment base comprising an aqueous carboxyvinyl polymer solution, said method comprising adding to the solution an amino acid selected from the group consisting of alanine, valine, isoleucine, serine, cysteine, ornithine, lysine, arginine, histidine, proline, threonine, and methionine in an amount effective for inhibiting the decrease in viscosity of the base due to irradiation by light, wherein the base is adjusted to a pH of about 5–9 and a viscosity of about 1,000–100,000 cP at 20° C.

4,983,387

HIV RELATED PEPTIDES, IMMUNOGENIC ANTIGENS, AND USE THEREFOR AS SUBUNIT VACCINE FOR AIDS VIRUS

Allan Goldstein, Washington, D.C., and Su-Sun Wang, Belmont, Calif., assignors to Viral Technologies Inc., Washington, D.C.

Continuation of Ser. No. 864,599, May 19, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,176

Int. Cl.[5] **A61K** *39/12;* **C07K** *7/08, 7/10, 17/08*

U.S. Cl. 424—88 **17 Claims**

1. A peptide having the formula

Ile-Y_1-Y_2-Lys-Asp-Thr-Lys-Glu-Ala-Leu-Y_3-Lys-Ile-Glu-Glu-Glu-Gln-Asn

wherein

Y_1 is Asp or Glu,

Y_2 is Val or Ile, and

Y_3 is Glu or Asp,

said peptide being capable of eliciting antibodies to HIV.

4,983,388

PROCESS OF PREPARING SILICONE COMPOSITION, AND COSMETIC AND LUSTERING MATERIALS CONTAINING SILICONE COMPOSITION OBTAINED

Satoshi Kuwata, Annaka; Takahiro Goi, Kanra; Takaaki Shimizu, and Tsutomu Ogihara, both of Jyouetsu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 405,927
Claims priority, application Japan, Sep. 12, 1988, 63-229298
Int. Cl.[5] A61K *31/695*
U.S. Cl. 424—401 18 Claims

1. A process for preparing a silicone composition, which comprises distilling away an organic solvent from a mixture of (1) a low viscosity silicone oil represented by the general formula, $R_a SiO_{(4-a)/2}$ wherein the R's may be the same or different, each being an unsubstituted or substituted, monovalent hydrocarbon residue containing 1 to 6 carbon atoms; and "a" ranges from 1.8 to 2.3, and having a viscosity of 100 centistokes or less at 25° C., and (2) an organosilica sol containing, as a dispersoid, spherical porous trimethylsilylated silica particles having an average particle size of 10 to 100 millimicrons, a specific surface area of 300 m^2/g or above, a trimethylsilyl group density of 0.5 to 10 micromol/m^2, and alkoxy group density of 0.5 to 10 micromol/m^2, and a silanol group density of 0.5 to 5 micromol/m^2, and homogeneously kneading the resulting mixture under shearing stress.

4,983,389

HERBICIDAL DELIVERY COMPOSITIONS AND METHODS FOR CONTROLLING PLANT POPULATIONS IN AQUATIC AND WETLAND ENVIRONMENTS

Richard Levy, Fort Myers, Fla., assignor to Lee County Mosquito Control District, Fort Myers, Fla.

Continuation-in-part of Ser. No. 32,532, Apr. 1, 1987, Pat. No. 4,818,534. This application Jun. 24, 1988, Ser. No. 210,799
Int. Cl.[5] A01N *25/34;* A61K *9/14*
U.S. Cl. 424—404 25 Claims

1. A controlled release herbicidal or herbicidal/pesticidal delivery composition for controlling a population of aquatic and wetland plants or related vegetation in dry, moist, semi-aquatic, or aquatic environments comprising: (a) at least one superabsorbent solid organic polymer selected from the group consisting of: hydrophilic acrylamide and acrylate polymers, co-polymers and ter-polymers which absorb over 100 times their weight in water, and (b) at least one formulation containing a herbicidal agent, said polymer and agent being present in a total amount effective to control a target population of aquatic and wetland plants or related vegetation and/or habitat-related pests by ground and/or aerial application techniques and wherein said composition is an admixture formed by mixing the superabsorbent polymer and the formulation containing a herbicidal or herbicidal/pesticidal agent.

4,983,390

TERRESTRAIL DELIVERY COMPOSITIONS AND METHODS FOR CONTROLLING INSECT AND HABITAT-ASSOCIATED PEST POPULATIONS IN TERRESTRIAL ENVIRONMENTS

Richard Levy, Fort Myers, Fla., assignor to Lee County Mosquito Control District, Fort Myers, Fla.

Continuation-in-part of Ser. No. 32,532, Apr. 1, 1987, Pat. No. 4,818,534. This application Jun. 24, 1988, Ser. No. 210,792
Int. Cl.[5] A01N *25/34;* A61K *9/14*
U.S. Cl. 424—404 27 Claims

1. A controlled release insecticidal, pesticidal or insecticidal/pesticidal delivery composition for controlling a population of terrestrial insects or pests in a variety of natural or artificial terrestrial environments comprising: at least one superabsorbent solid organic polymer selected from the group consisting of: hydrophilic acrylamide and acrylate polymers, co-polymers and ter-polymers which absorb over 100 times their weight in water, and at lest one formulation containing an insecticidal or pesticidal agent, said polymer and agent being present in a total amount effective to control a target population of terrestrial insects and/or habitat-related/associated pests when applied to a target habitat, insect, pest, or host organism by ground and aerial application techniques; and wherein said composition is an admixture formed by mixing the superabsorbent polymer and the formulation containing an insecticidal, pesticidal, or insecticidal/pesticidal agent.

4,983,391

FABRIC INSECTICIDE

Ryonosuke Muneyuki, and Hiroyuki Kanamaru, both of Tokyo, Japan, assignors to S.T. Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 391,043
Int. Cl.[5] A01N *25/34, 25/00, 25/08, 47/10*
U.S. Cl. 424—408 4 Claims

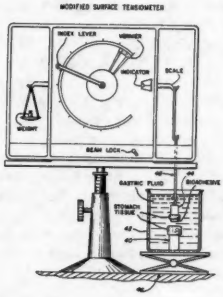
1. An insecticide in a solid form to be used by vaporization to prevent damage to a fibrous material caused by an insect harmful to fibrous materials, which comprises as an active ingredient at least one carbamic ester selected from the group consisting of methyl carbamate and ethyl N-methylcarbamate.

4,983,392

BIOADHESIVE COMPOSITIONS AND METHODS OF TREATMENT THEREWITH

Joseph R. Robinson, Madison, Wis., assignor to Bio-Mimetics, Inc., Lexington, Mass. and Columbia Laboratories, Inc., Miami, Fla.

Continuation of Ser. No. 909,960, Sep. 22, 1986, Pat. No. 4,795,436, which is a continuation of Ser. No. 690,483, Dec. 20, 1984, Pat. No. 4,615,697, which is a continuation-in-part of Ser. No. 551,295, Nov. 14, 1983, abandoned. This application Dec. 20, 1988, Ser. No. 287,464
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.[5] A61F *2/00*
U.S. Cl. 424—427 12 Claims



1. A controlled release ophthalmic treatment composition including a bioadhesive and an effective amount of an ophthalmic treating agent, said bioadhesive comprising a water-swellable, but water-insoluble, particular cross-linked carboxyl-functional polymer having particles sized so that visual impairment is substantially minimized when said composition is contacted with a mucous membrane of the eye, said polymer containing (a) a plurality of repeating units of which at least about 80 percent contain at least the carboxyl functionally, and (b) about 0.05 to about 1.5 percent cross-linking agent substantially free from polyalkylenyl polyether, said percentages being based upon the weights of the unpolymerized repeating unit cross-linking agent, respectively.

4,983,393

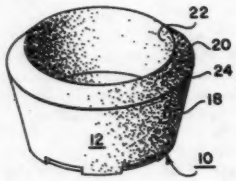
INTRA-VAGINAL DEVICE AND METHOD FOR SUSTAINED DRUG RELEASE

Robert S. Cohen, New York, N.Y.; James M. Pierce, and William H. Kinsey, both of Coral Gables, Fla., assignors to MaxiMed Corporation, New York, N.Y.

Continuation of Ser. No. 75,898, Jul. 21, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 257,156

Int. Cl.[5] A61K *9/02*

U.S. Cl. 424—430 5 Claims



1. A solid, shaped, integral, solidified composition suitable for use as an intra-vaginal insert and capable of dissolution or disintegration in the presence of vaginal fluids, comprising agarose in an amount from about 0.1% to about 4% by weight, agar in that amount of about 0.1% to about 4% by weight, saline solution, high molecular weight glycosaminoglycans of about 100,000 Daltons to about 1,000,000 Daltons in an amount from about 0.1% to about 20% by weight, collagen in an amount from about 0.1% to about 20% by weight, fibrin in an amount from about 0.1% to about 20% by weight and an enzyme selected from the group consisting of agarase, protease, collagenase and saccharidase, said enzyme being present in said composition in an amount from about 0% to about 10% by weight.

4,983,394

FLAVOR ENHANCING AND MEDICINAL TASTE MASKING AGENT

Mamoun M. Hussein, Mt. Lakes, and Shirley A. Barcelon, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1990, Ser. No. 518,369

Int. Cl.[5] A61K *9/20, 9/26*

U.S. Cl. 424—440 10 Claims

1. A confection for dissolving in the oral cavity comprising:

(a) ingestible volatile flavor oil; and

(b) volatile oil mellowing, suppressing and bitterness-reducing agent selected from the group consisting of fenchone, borneol and iso-borneol in an amount which is sensorially undetected in the oral cavity but sufficient to modify sensory perception of said volatile oil as it is released in the oral cavity said amount being about 0.3 to 50 parts per million (ppm) by weight of said confection.

4,983,395

DEVICE FOR ADMINISTERING AN ACTIVE AGENT TO THE SKIN OR MUCOSA

Yunik Chang, Toms River, N.J.; Dinesh C. Patel, Murray, and Charles D. Ebert, Salt Lake City, both of Utah, assignors to TheraTech Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 119,617, Nov. 12, 1987, Pat. No. 4,849,224. This application Mar. 21, 1989, Ser. No. 326,536

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[5] A61F *13/02*

U.S. Cl. 424—448 6 Claims

1. A device for administering an active agent to the skin or mucosa of an individual comprising a laminated composite of:

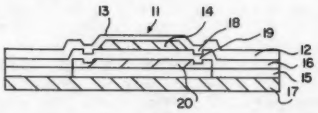
(a) a backing layer;

(b) an active agent-permeable membrane, the backing layer and membrane defining

(c) a reservoir therebetween that contains a formulation of the active agent, said reservoir having a smaller periphery than the backing layer and membrane such that a portion of the backing layer and membrane extends outwardly of the periphery of the reservoir;

(d) a first peelable active agent formulation-impermeable layer that underlies the reservoir and a portion of said outwardly extending portion of the backing layer and membrane;

(e) an adhesive layer that underlies and covers the first peelable active agent formulation-impermeable layer and said outwardly extending portion of the backing layer and membrane;



(f) a second peelable active agent formulation-impermeable layer that underlies and covers the adhesive layer;

(g) a permanent heat seal about the periphery of the reservoir between the backing layer and the membrane; and

(h) a peelable heat seal between the membrane and the first peelable active agent formulation-impermeable layer located underneath and at a radius not less than that of the permanent heat seal, said permanent and peelable heat seals providing barriers to migration of components of the active agent formulation from the reservoir into the adhesive layer and said first and second peelable active agent impermeable layers being bonded together such that when the second peelable layer is removed from the device the peelable heat seal is broken and the first peelable layer and underlying portion of the adhesive layer is removed therewith.

4,983,396

PERCUTANEOUS PENETRATION ENHANCER OF OLEIC ACID AND 2-ETHYL-1,3-HEXANEDIOL

Nicholas Bodor, Gainesville, Fla., and Thorsteinn Loftsson, Reykorviv, Iceland, assignors to Key Pharmaceuticals, Inc., Kenilworth, N.J.

Division of Ser. No. 198,798, May 25, 1988, Pat. No. 4,885,174, which is a division of Ser. No. 806,257, Aug. 16, 1988, Pat. No. 4,764,381. This application Sep. 26, 1989, Ser. No. 412,730

Int. Cl.[5] A61F *13/00;* A61K *9/70, 31/045;* A01N *31/00*

U.S. Cl. 424—449 2 Claims

1. A transdermal delivery system, comprising:

a pharmaceutically active ingredient; and

a carrier wherein the carrier is comprised of 2-ethyl-1,3-hexanediol in an amount of 50% or more based on the weight of the carrier, said 2-ethyl-1,3-hexanediol is a penetration enhancer for the active ingredient.

4,983,397

PHARMACEUTICAL COMPOSITIONS CONSISTING OF ACYLATED PHOSPHOLIPIDS

Alan J. Schroit, and Rajiv Nayar, both of Houston, Tex., assignors to Board of Regents, University of Texas System, Houston, Tex.

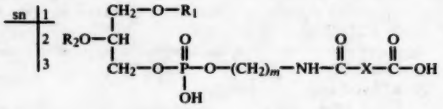
Continuation-in-part of Ser. No. 766,625, Aug. 19, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 888,601

Int. Cl.[5] A61K *9/52;* B01J *13/02*

U.S. Cl. 424—450 11 Claims

1. A pharmaceutical liposome composition comprising

(a) a first phospholipid of the formula:



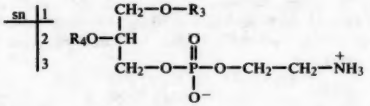
wherein m is 2 or 3;

each of R_1 and R_2, independently of the other, is alkyl, alkenyl, or acyl of from 10 to 20 carbon atoms;

X is a direct bond, C_1–C_4 alkylene which is unsubstituted or substituted with hydroxy, or C_2–C_4 alkenylene which is unsubstituted or substituted with hydroxy;

or a pharmaceutically acceptable salt of said first phospholipid;

(b) a second phospholipid of the formula:



wherein each of R_3 and R_4, independently of the other, is the acyl group of a carboxylic acid of from 10 to 20 carbon atoms which is saturated, mono-unsaturated, or di-unsaturated, said second phospholipid being present with respect to said first phospholipid in a mole percent ratio of from about 90:10 to about 50:50;

(c) one or more immunomodulators, the ratio of the molar amount of said immunomodulators to the total molar amount of said first and second phospholipids being from about 0.0001:1 to about 0.1:1; and

(d) a pharmaceutically acceptable carrier solution, the pH of which is buffered to from 7.0 to 7.8.

4,983,398

SUSTAINED RELEASE DRUG DOSAGE FORMS CONTAINING HYDROXYPROPYLMETHYLCELLULOSE AND ALKALI METAL CARBOXYLATES

Norman G. Gaylord, New Providence, N.J., and Ashok Nigalaye, East Rockaway, N.Y., assignors to Forest Laboratories, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 135,667, Dec. 21, 1987, abandoned. This application Dec. 15, 1988, Ser. No. 284,931

Int. Cl.[5] A61K *9/20*

U.S. Cl. 424—465 **10 Claims**

1. A therapeutically active solid unit dosage form having a controlled and sustained release pattern upon administration comprising a mixture of a therapeutically active medicament and a carrier base material consisting essentially of (a) one or more water-soluble nonionic cellulose ethers, wherein at least one of the cellulose ethers is a hydroxypropylmethylcellulose having a number average molecular weight of at least 50,000, and (b) an alkali metal carboxylate, wherein the carrier base comprises less than 30 weight-% of the total weight of the dosage form.

4,983,399

DIRECT COMPRESSION CARRIER COMPOSITION

Shabir Z. Maish, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1989, Ser. No. 423,157

Int. Cl.[5] A61K *9/20*

U.S. Cl. 424—465 **20 Claims**

1. A direct compression carrier composition comprising a compressible, free-flowing particulate composition comprising (1) at least 30 weight percent of a powder of an ester of cellulose and residues of carboxylic acids having 2 to 4 carbon atoms having a degree of esterification of about 1.0 to 3.0 having a mean diameter of about 70 to 200 microns, a bulk density of about 0.2 to 0.6 g/mL and a particle size distribution such that the cumulative weight percent of the cellulose ester powder retained on Number 60, 80 100, 120, 140 and 200 sieves is:

Sieve Number	Cumulative Weight Percent Retained
60	about 5 to 30
80	about 10 to 40
100	about 20 to 60
120	about 36 to 75
140	about 45 to 85
200	about 60 to 92

and the weight percent of cellulose ester powder which passes through a Number 325 sieve is not more than about 12 weight percent, and (2) a lubricant.

4,983,400

CONTROLLED RELEASE COMBINATION OF CARBIDOPA/LEVODOPA

Robert E. Dempski, Dresher; Edward C. Scholtz, King of Prussia; Donald W. Nibbelink, Lansdale, and Scott A. Reines, New Hope, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 315,057, Feb. 24, 1989, Pat. No. 4,900,755, which is a division of Ser. No. 223,861, Jul. 25, 1988, Pat. No. 4,832,957, which is a continuation-in-part of Ser. No. 131,601, Dec. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 874,988, Jun. 16, 1986, abandoned. This application Dec. 1, 1989, Ser. No. 444,222

Int. Cl.[5] A61K *9/22, 9/26, 31/78*

U.S. Cl. 424—469 **3 Claims**

1. A controlled release solid oral dosage formulation consisting essentially of a uniform dispersion of 5–300 mg of carbidopa, 20–1200 mg of levodopa in a polymer vehicle of 2 to 120 mg of polymethyl methacrylate, whereby following administration the carbidopa and levodopa are released slowly and simultaneously from the formulation.

4,983,401

SUSTAINED RELEASE PHARMACEUTICAL PREPARATIONS HAVING PH CONTROLLED MEMBRANE COATINGS

Herman J. Eichel, and Brent D. Massmann, both of Columbus, Ohio, assignors to Kinaform Technology, Inc., Dayton, Ohio

Filed May 22, 1989, Ser. No. 354,105

Int. Cl.[5] A61K *9/24, 9/16, 9/50, 9/54*

U.S. Cl. 424—473 **23 Claims**

1. A sustained-release pharmaceutical preparation comprising multi-units of microparticles comprising:

(a) a granular core containing a water soluble drug,

(b) a pH controlled diffusion membrane surrounding said core drug, said pH controlled diffusion membrane being formed from a film forming polymer comprising hydrophobic side chains attached to an enteric polymer which results in said film forming polymer being hydrophobic at pH range as found in the stomach and hydrophilic at pH range as found in the intestines, while said pH controlled diffusion membrane remains intact at pH range as found in the intestines.

4,983,402

ORALLY ADMINISTERABLE ANF

Solomon S. Steiner, Mt. Kisco, N.Y., assignor to Clinical Technologies Associates, Inc., Elmsford, N.Y.

Filed Feb. 24, 1989, Ser. No. 315,393
Int. Cl.[5] A61K *9/50*
U.S. Cl. 424—491 6 Claims

1. Orally administerable composition for regulating mammalian blood pressure comprising atrial natriuretic factor encapsulated within acidic proteinoid microspheres having diameters of less than about 10 microns and formed of thermal condensation polymers of mixed amino acids.

4,983,403

GRANULES FOR FEEDING RUMINANTS WITH AN ENZYMATICALLY DEGRADABLE COATING

Pierre Ardaillon, Saint-Priest, and Paul Bourrain, Dardilly, both of France, assignors to Rhone-Poulenc Sante, Antony, France

Filed Dec. 13, 1988, Ser. No. 283,907
Claims priority, application France, Dec. 15, 1987, 87-17455
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—2 18 Claims

1. Composition for feeding an additive to ruminants which is stable in the rumen and in the abomasum and which is degraded by the enzymes of the intestine thereby releasing the additive, in the form of granules consisting essentially of a ruminant feed additive core provided with a coating in a single layer of a mixture consisting of 50 to 90% by weight of zein in combination with a non-water-soluble polymer and 0 to 10% by weight of a plasticizing agent; or of 10 to 50% by weight of zein in combination with a hydrophobic substance and 0 to 10% by weight of a non-water-soluble polymer, the said mixture constituting 5 to 60% by weight of the granules.

4,983,404

CONTROLLED RELEASE FLAVOR SYSTEM AND METHOD OF PREPARATION

Krishna Raman, Randolph; Subraman R. Cherukuri, Towaco, both of N.J.; Gul Mansukhani, Staten Island, N.Y., and Steven M. Faust, Stanhope, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 5, 1989, Ser. No. 361,529
Int. Cl.[5] A23G *3/30*; A23L *1/22*
U.S. Cl. 426—3 27 Claims

1. A flavor delivery system offering improved uniformity and extended duration of flavor release and temperature stability consisting essentially of a non-aqueous solution mixture of:

(a) a flavor component in an amount of from about 20% to about 80% by weight of the final delivery system; and

(b) a resin component, said resin component comprising a rosin, in an amount of from about 80% to about 20% by weight of the final delivery system;

wherein said resin component protects, holds and masks the aroma of said flavor component even at high temperatures, whereby said flavor delivery system may be formulated with higher concentrations of said flavor component and exhibits said extended duration of flavor release.

4,983,405

REDUCED AND LOW-CALORIE SUGAR AND SUGARLESS CHEWING GUM COMPOSITIONS CONTAINING FIBER

Subraman R. Cherukuri, Towaco; Steven M. Faust, Stanhope, both of N.J., and Gul Mansukhani, Staten Island, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 9,173, Jan. 30, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 288,749
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—3 15 Claims

1. A chewing gum composition having a reduced calorie content comprising:

(a) a gum base present in an amount of from about 45 to about 80% by weight, said gum base containing about 6% to about 10% of a wax having a melting point below 60° C. and from about 10% to about 25% by weight of a polyvinyl acetate having a medium molecular weight of about 35,000 to 55,000;

(b) a sweetener present in amounts sufficient to effectuate sweetness;

(c) a flavor; and

(d) about 4% to about 20% by weight of an oil-containing unpurified cereal fiber compatible with the base, wherein the oil content of said fiber is about 1% to about 4% by weight of the fiber; and wherein the calorie content of the chewing gum composition is about 0.1 to about 2.1 calories/gram.

4,983,406

PRESERVATION OF FEED

James W. Ayres; William E. Sandine, both of Corvallis, and Richard B. Parker, Portland, all of Oreg., assignors to Wesman Foods, Inc., Beaverton and The State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University, Eugene, both of, Oreg., a part interest to each

Filed Apr. 25, 1989, Ser. No. 343,948
Int. Cl.[5] A23K *3/00*
U.S. Cl. 426—9 10 Claims

1. A process for preserving an animal feed product, the process comprising:

addition of dimethyl fumarate to the feed product wherein the moisture content of the feed is 15% or more when the dimethyl fumarate is added and dimethyl fumarate is added in an amount effective to inhibit mold of at least 0.001% by weight of the feed; and

allowing the feed product to ferment in the presence of the dimethyl fumarate wherein fermentation lowers the pH of the animal feed by at least 0.5 pH units or more, the dimethyl fumarate being present in an amount insufficient to prevent such fermentation.

4,983,407

PROCESS FOR PRODUCING MARMELO WINES

Takashi Miyata, Setagaya, Japan, assignor to Hakodate Winery Ltd., Hokkaido, Japan

Filed Feb. 14, 1990, Ser. No. 479,852
Int. Cl.[5] C12G *1/00*
U.S. Cl. 426—15 2 Claims

1. A process for producing marmelo wines, the process comprising crushing marmelo fruits, pressing said fruits to remove marmelo juice, adding gelatin in an amount of 0.1 to 0.5 per cent by volume to said marmelo juice to precipitate and remove a polyphenol compound contained in said marmelo juice, and adding wine yeast in an amount of 200 to 250 ppm by volume to said marmelo juice for low temperature fermentation.

4,983,408

METHOD FOR PRODUCING COFFEE EXTRACTS

Ralph L. Colton, 101 Tanglewood Dr., Lansdale, Pa. 19446

Filed Dec. 7, 1988, Ser. No. 280,945
Int. Cl.[5] A23F *5/10*
U.S. Cl. 426—45 17 Claims

1. A method for producing an improved yield of coffee extract which comprises:

(1) pre-treating an aqueous mixture of ground roast coffee with steam in a closed vessel under pressure at a temperature in excess of 200° C.;

(2) maintaining said temperature and pressure for a period of from about 1–10 minutes;

(3) instantaneously exposing the contents of said vessel to the atmosphere without cooling so as to bring said contents to atmospheric levels; and

(4) treating the slurry thus obtained with a member selected

from the group consisting of a hydrolytic enzyme and a mixture of hydrolytic enzymes.

4,983,409

ION WATER FOR PRODUCTION OF FOODS AND BEVERAGES

Atsushi Nasu, 99 Katako, Youkaichiba-shi, Chiba-ken, Japan

Filed Mar. 23, 1990, Ser. No. 498,213
Claims priority, application Japan, Apr. 3, 1989, 1-84534; Aug. 17, 1989, 1-211885
Int. Cl.[5] A23L *2/00*
U.S. Cl. 426—66 5 Claims

1. Ion water for the production of beverages and foods which is obtained by:

acidifying sea water;

adding a strong alkali agent to said acidified sea water to raise the pH and to form a precipitate (a);

removing said precipitate (a) and concentrating and cooling the remaining solution to form a precipitate (b); and

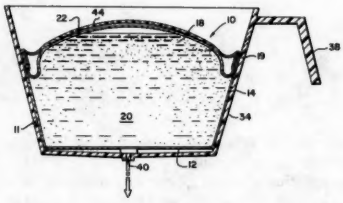
dissolving said precipitate (b) in water to form said ion water.

4,983,410

DISPOSABLE EXPANDABLE TEA CARTRIDGE

Jack A. Dinos, Atlanta, Ga., assignor to Southern Tea Company, Marietta, Ga.

Continuation-in-part of Ser. No. 111,719, Oct. 23, 1987. This application Aug. 17, 1988, Ser. No. 232,947
Int. Cl.[5] A47G *19/16;* A47J *31/00;* B65D *85/00*
U.S. Cl. 426—77 3 Claims



1. A disposable cartridge for brewing tea by passing hot water therethrough, which cartridge is in a dry condition prior to brewing and which assumes a wetted condition when exposed to hot liquid during brewing, the cartridge being for placement in a brewing basket of a brewing machine, the brewing basket having a side wall extending generally upwardly from a bottom portion, the cartridge comprising:

(a) a cup shaped receptacle formed of liquid permeable sheet material, said receptacle defining a cavity, said receptacle having a bottom wall and a circumferentially continuous upstanding side wall, with said cartridge being dimensioned such that said receptacle side wall sealingly engages said side wall of the brewing basket in the wetted condition of the cartridge;

(b) a concave cup shaped cover formed of liquid permeable sheet material and having a bottom wall and a circumferentially continuous upstanding side wall, said cover and said receptacle side wall each defining a terminal annular rim, respectively, with said annular rim of said cover joined to said annular rim of said receptacle such that said cover is nested within said receptacle in the dry condition to assume a concave condition relative to said receptacle, said cover bottom wall and said receptacle bottom wall being spaced apart and defining an expandable tea containing chamber therebetween;

(c) a premeasured quantity of dry, infusible tea leaf in said team containing chamber;

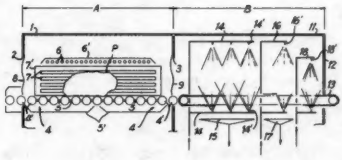
(d) said cover side wall and said receptacle side wall being unsealed to each other except at said annular rims, with said cover side wall in the dry condition being in close overlying proximity with said receptacle side wall, said cover sidewall being unsealed to said receptacle side wall and configured such that said cover is inflatable relative to said receptacle by virtue of the movement of said cover bottom wall and unsealed cover side wall relative to said receptacle when said cartridge is wetted during infusion and said tea expands, so that said cover side wall in the wetted condition will be spaced away from said receptacle side wall in an unfolded relationship therewith, with said cover having an overall upwardly convex shape when the cartridge is in the wetted condition; said cover capable of expanding to accomodate at least substantially the full expansion of the wetted tea.

4,983,411

STERILIZATION OF VACUUM PACKAGED RAW MEAT

Yoshio Tanaka, and Katsumi Kawaguchi, both of Tokyo, Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1989, Ser. No. 397,983
Claims priority, application Japan, Aug. 29, 1988, 63-212530
Int. Cl.[5] A23B *4/005, 4/015*
U.S. Cl. 426—234 4 Claims



1. A process for sterilizing and vacuum packaging raw meat comprising: vacuum packaging raw meat in a heat shrinkable, ultraviolet transmissive packaging film;

exposing said vacuum package to ultraviolet radiation to irradiate said vacuum packaged raw meat sufficient to result in the sterilization of bacteria on the surface of said raw meat; and then

exposing said vacuum package to a high-temperature atmosphere sufficient to heat shrink said packaging film around said raw meat and to further sterilize any remaining bacteria on the surface of said raw meat.

4,983,412

METHOD AND DEVICE FOR PRODUCING AQUEOUS EXTRACTS FROM COFFEE

Reinhard Hüuslein, Minden, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 135,371, Dec. 21, 1987, Pat. No. 4,779,520. This application May 9, 1988, Ser. No. 192,028
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643879; May 7, 1987, 3715165
Int. Cl.[5] A23F *5/00;* A47J *31/00*
U.S. Cl. 426—238 17 Claims

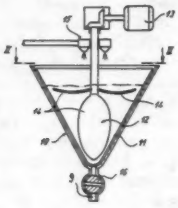
1. A method for producing an aqueous extract from coffee, comprising the steps of:

adding coffee to a vessel;

adding heated water to said vessel;

stirring a resulting coffee-water mixture during a predetermined brewing time to produce an even distribution of coffee in said mixture and to allow expulsion of gas from

said mixture to effect in at least partial degassing thereof; and



filtering said coffee-water mixture at the end of said predetermined brewing time to produce a filtered aqueous coffee extract.

4,983,413

LOW-CALORIE POLYSILOXANE OIL FOOD PRODUCTS

Richard S. Meyer, Tacoma, and James W. Duersch, Bonney Lake, both of Wash., assignors to Curtice-Burns, Inc., Rochester, N.Y.

Division of Ser. No. 204,048, Jun. 8, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 485,786

Int. Cl.[5] A23L *1/24*

U.S. Cl. 426—589 3 Claims

1. A low-calorie food dressing comprising oil and non-oil components wherein the oil component comprises from about 5% to 100% methylphenylpolysiloxane.

4,983,414

METHOD OF PRODUCING TOFU-LIKE FOOD

Koji Sengoku, Nara, and Misako Namba, Ikoma, both of Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

Filed Sep. 19, 1989, Ser. No. 409,294

Claims priority, application Japan, Sep. 21, 1988, 63-237291

Int. Cl.[5] D23L *1/20*

U.S. Cl. 426—634 13 Claims

1. A method of producing a tofu-like food consisting essentially of the steps of:

(A) adding a coagulating agent to a soybean milk and dehydrating the coagulated product;

(B) mashing the resulting dehydrated product into a paste;

(C) adding an alkali to said coagulated product before, after or during the mashing thereby adjusting the pH value of said paste to 6.5 or above; and

(D) subjecting said paste to heat-forming under a condition of pH 6.5 to 7.0.

4,983,415

METHOD OF MAKING PERMANENT IMAGES ON RECORDING SURFACE HAVING A THERMOSENSITIVE COLOR-DEVELOPING LAYER THEREON

Douglas C. Arndt, Thousand Oaks, and Virgle L. Hedgcoth, Pomona, both of Calif., assignors to Identicator Corporation, San Bruno, Calif.

Filed Jul. 21, 1989, Ser. No. 383,971

Int. Cl.[5] A61B *5/117*

U.S. Cl. 427—1 24 Claims

1. A method of recording prints of a person's finger, palm or foot comprising:

(a) providing a thermosensitive recording surface containing a thermosensitive color-developing layer, the layer comprising a chromogenic dye, an organic acid developer reactive with the dye to develop a color and a thermosensitive barrier for separating the acid and the dye;

(b) applying a solution of a chemical reagent containing one or more metallic salts to the fingerprint, palm print or footprint area of a person whose finger, palms or foot is to printed;

(c) depositing the solution of the chemical reagent from the ridges of the fingerprint, palm print or footprint pattern area to said recording surface whereby the chemical reagent reacts with the organic acid or dye or both to provide a permanent colorant product representative of the ridge pattern of the finger, palm or foot of said person.

4,983,416

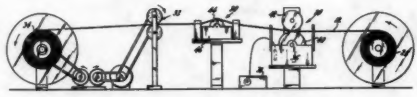
MANUFACTURING METHOD FOR AN OCCULT FECAL BLOOD TEST SLIDE

Peter Hunsinger, Ridgewood, and Andrew Zwarun, Roslyn Heights, both of N.Y., assignors to Propper Manufacturing Co., Inc., LIC, N.Y.

Continuation of Ser. No. 28,038, Mar. 20, 1987, abandoned, which is a continuation of Ser. No. 698,011, Feb. 4, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 147,569

Int. Cl.[5] G01N *21/78, 33/72*

U.S. Cl. 427—2 8 Claims



1. A method for fabricating a test slide including an enclosure comprising the steps of:

a. impregnating a length of carrier material with a reagent which, when mixed with an appropriate developing reagent, provides a color change in the presence of blood;

b. feeding said length of carrier material adjacent a first application station and applying a line of barrier material to one surface of said length of carrier along a first selected line at said first application station;

c. feeding said length of carrier material adjacent a second application station and applying a line of positive test material to said one surface of said length of carrier along a second selected line at said second application station;

d. positioning a sheet of said length of carrier material having said line of barrier material and said line of positive test material on only one side thereof within an enclosure of the test slide.

4,983,417

METHOD OF WAXING SHUFFLEBOARD DISCS

Joseph S. Dunn, 13611 Warbler Dr., Fort Myers, Fla. 33908

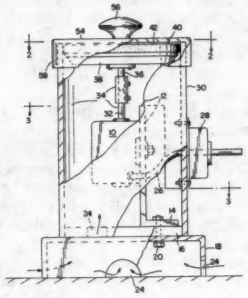
Filed Sep. 14, 1989, Ser. No. 407,128

Int. Cl.[5] B05D *1/00*

U.S. Cl. 427—11 2 Claims

1. The method of waxing the court contacting surface of a

donut shaped shuffleboard puck, which comprises the steps of using an electric motor to rotate the puck about a vertical axis



with the court contacting surface of the puck exposed, and applying wax to the exposed surface of the puck.

4,983,418

SILICONE HAIRSPRAY COMPOSITIONS

Carolyn S. Murphy, Mason, Ohio, and Mark R. Prausnitz, Somerville, Mass., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1989, Ser. No. 429,895
Int. Cl.[5] A61K *7/00*
U.S. Cl. 424—47 33 Claims

1. A hair spray composition comprising:

(a) from about 0.05% to about 10.0% by weight of the composition of a silicone gum;

(b) from about 0.05% to about 7.5% by weight of the composition of a dispersing aid wherein said dispersing and is a surfactant emulsifier or a hydrophobically-modified, quaternary ammonium treated montmorillonite clay or mixtures thereof for the silicone gum; and

(c) from about 20% to about 95% of a volatile carrier.

4,983,419

METHOD FOR GENERATING THIN LAYERS ON A SILICONE BASE

Hans-Joachim Henkel, Erlangen; Helmut Markert, Nuremberg; Wolfgang Roth, Uttenreuth, and Wolfgang Kautek, Berlin, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 384,291
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826713
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—53.1 18 Claims

1. A method for generating a thin layer on a silicone base comprising the step of photo hardening a non-functionalized organosiloxane having alkyl groups or alyl and aryl groups, or mixtures of such organosiloxanes, so as to photochemically polymerize and/or cross-link the organosiloxane, said step of photo hardening being accomplished by irradiating the organosiloxane with pulsed laser radiation with a wavelength of less than 400 nm, wherein the pulse duration is 10 ps to 1 ms, the pulse frequency is 1 Hz to 10 kHz and the energy density is at least 1 J/cm^2, and wherein the irradiation takes place with one or more pulses.

4,983,420

METHOD OF APPLYING A THERMALLY BLACK LAYER TO A HEATING MEMBER FOR AN INDIRECTLY HEATED CATHODE

Stefan M. Wolfrum, Uden; Johannes J. Ponjée, and Angela C. L. Van de Poel, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1989, Ser. No. 410,396
Claims priority, application Netherlands, Sep. 29, 1988, 8802387
Int. Cl.[5] B05D *5/12, 7/14;* H01J *1/20*
U.S. Cl. 427—77 3 Claims

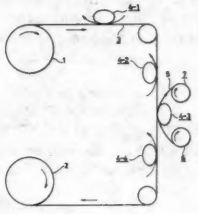
1. A method of applying a thermally black layer to a heating member for an indirectly heated cathode, in which a single layer of a liquid suspension comprising tungsten particles and aluminium oxide particles is applied to the heating member, after which this layer is sintered, thereby forming the thermally black layer, characterized in that the tungsten particles are provided with a chemically bonded monomolecular layer of an aliphatic monocarboxylic acid prior to preparation of the suspension.

4,983,421

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIA

Kouichi Mochizuki; Hiromi Nakahara, and Tadashi Yasunaga, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 92,260, Sep. 2, 1987, abandoned. This application Dec. 13, 1989, Ser. No. 449,339
Claims priority, application Japan, Sep. 2, 1986, 61-205042
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—130 15 Claims



1. A method for producing a metal thin film type magnetic recording medium having a ferromagnetic metal or alloy thin film provided on a non-magnetic support, comprising the steps of:

forming said ferromagnetic metal or alloy thin film on said non-magnetic support;

providing a lubricant having —COOH or —COOM in its molecule, M denoting metal, on the surface of said ferromagnetic metal or alloy thin film; and

then buffing said lubricant with a non-woven fabric selected from the group consisting of polyesters, polyruethane-impregnated polyesters, and polyester-Nylon composites, said buffing being conducted so that the lubricant molecules become regularly oriented.

4,983,422

PROCESS FOR FORMING ALUMINUM OXIDE CERAMIC COMPOSITES

H. O. Davis, Alameda, and Marvin Pennell, San Leandro, both of Calif., assignors to Kaiser Aerotech, San Leandro, Calif.

Filed Mar. 11, 1988, Ser. No. 166,958
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—228 14 Claims

1. A process for forming aluminum oxide ceramic composites, said process comprising:

introducing a liquid aluminum oxide precursor material into a reinforcement fabric substrate wherein said liquid aluminum oxide precursor is ionic aluminum suspended in a n aqueous alcohol solution in the presence of a mineral acid;

curing the aluminum oxide precursor; and

converting the cured aluminum oxide precursor material to an aluminum oxide ceramic phase by oxidation at an elevated temperature.

4,983,423

METHOD OF FORMING A POROUS INORGANIC MEMBRANE ON A POROUS SUPPORT USING A REACTIVE INORGANIC BINDER

Robert L. Goldsmith, Belmont, Mass., assignor to CeraMem Corporation, Belmont, Mass.

Filed May 24, 1988, Ser. No. 198,195

Int. Cl.[5] B05D *3/02, 7/22*

U.S. Cl. 427—230 **36 Claims**

1. A method of forming a porous inorganic separation membrane on a porous support to establish a membrane device for use in membrane separations, comprising:

applying a coating of a mixture of thermally refractory particles and a thermally reactive inorganic binder to the porous support to form a first layer, the inorganic binder reacting at a first temperature which is lower than a second temperature at which the refractory particles sinter;

firing the support to a firing temperature at least as high as the first temperature and less than the second temperature to react the inorganic binder; and

cooling the support to form the porous inorganic separation membrane from the first layer having the refractory particles bound to each other and to the support by the inorganic binder to establish the membrane device.

24. The method of claim 1 in which the support is a porous tube and the coating is applied on the inner surface.

4,983,424

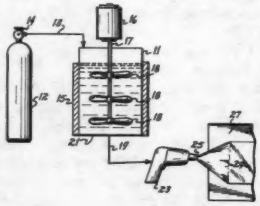
METHOD FOR FORMING A PERMANENT FOAM COATING BY ATOMIZATION ONTO A SUBSTRATE

Laurence B. Saidman, Westlake, and James C. Smith, Lorain, both of Ohio, assignors to Nordson Corporation, Cleveland, Ohio

Filed Aug. 4, 1989, Ser. No. 389,671

Int. Cl.[5] B05D *5/00*

U.S. Cl. 427—243 **11 Claims**



1. A method of forming a permanent foam coating on a substrate comprising:

atomizing a coating composition containing a gas foaming agent to form atomized particles containing residual dissolved gas foaming agent;

projecting said atomized particles containing gas foaming agent onto the substrate to deposit a continuous coating containing dissolved gas foaming agent, and

controlling the deposition of said atomized particles to allow said gas foaming agent to expand and form a permanent foam coating on said substrate.

4,983,425

VAPOR PHASE HARDENING OF CURABLE ORGANIC COMPOUNDS

Fulvio J. Vara, Chester, and James A. Dougherty, Pequannock, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Sep. 1, 1989, Ser. No. 401,693

Int. Cl.[5] B05D *3/04, 3/10*

U.S. Cl. 427—340 **15 Claims**

1. A process for curing a curable normally liquid ether, thioether or imine material by contacting said material for less than 1 minute in a treating zone with an effective polymerizing amount of a volatile, hard Lewis acid in the vapor state in an anhydrous atmosphere at a temperature below the deformation temperature of any substrate used as a support for said material to produce a hardened, moisture and oxidation resistant product.

4. The process of claim 1 wherein said curable material is coated on a plastic substrate prior to treatment and wherein said curing is effected at a temperature below the deformation temperature of said substrate.

4,983,426

TIECOAT FOR USE WITH MASTIC COATING APPLICATIONS

Arthur D. Jordan, Jr., Penllyn, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 24, 1988, Ser. No. 262,369

Int. Cl.[5] B05D *1/36, 7/00*

U.S. Cl. 427—407.1 **10 Claims**

1. A method for improving the quality of a mastic coating system comprising:

(a) forming a tiecoat composition comprising at least one water-insoluble latex polymer and at least one detackifying agent, wherein said latex polymer has a glass transition temperature from about −20° C. to about 0° C.;

(b) applying said tiecoat composition to a substrate surface; and

(c) applying a mastic coating to said tiecoat composition coated onto said surface.

4,983,427

SPRAY DEPOSITING OF METALS

Dennis H. Sansome, Sutton Coldfield, England, and Alfred R. E. Singer, Swansea, Wales, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 210,414, Jun. 21, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 456,584

Claims priority, application United Kingdom, Jun. 26, 1987, 8715035

Int. Cl.[5] B05D *1/08, 3/12*

U.S. Cl. 427—347 **18 Claims**

1. A process for forming a metal product by spraying molten metal onto a substrate, characterized in that the substrate onto which the spray is directed is conditioned to have non-wetting characteristics and is vibrated during the spraying to enhance those characteristics and such that the liquid spray particles do not wet the substrate and form a deposit which is easily detached from it.

4,983,428

ETHYLENETHIOUREA WEAR RESISTANT ELECTROLESS NICKEL-BORON COATING COMPOSITIONS

Henry M. Hodgens, II, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 9, 1988, Ser. No. 204,311

Int. Cl.[5] B05D *1/18*

U.S. Cl. 427—443.1 **14 Claims**

7. A process of electroless plating a nickel-boron coating onto a substrate material comprising admixing a composition consisting essentially of a water soluble nickel salt, a chelating

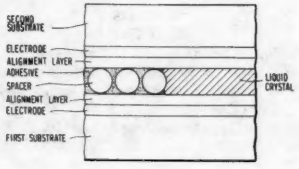
agent, an alkali metal hydroxide, a boron containing reducing agent and 0.098 X 10^{-5} mole per liter to 9.8 X 10^{-5} mole per liter of ethylenethiourea, heating the solution to a temperature of 185° F. to 215° F., immersing the substrate in the solution, and removing the coated substrate from the solution, resulting in a nickel boron coated substrate having improved wear resistance.

4,983,429

PROCESS FOR PRODUCING CELLS FOR LIQUID CRYSTAL DISPLAY DEVICES

Takashi Takayanagi, and Hideo Kawaguchi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 218,003, Jul. 13, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 445,156
Claims priority, application Japan, Jul. 13, 1987, 62-174501
Int. Cl.[5] C09K *19/00*
U.S. Cl. 428—001 **3 Claims**



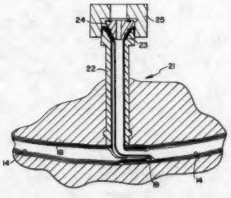
3. A liquid crystal device comprising, in sequence, at least a first substrate, an electrode, an alignment layer, a layer having a display cell containing a liquid crystal, a second alignment layer, a second electrode, and a second substrate, wherein said display cell additionally contains an adhesive on display area in a dot pattern with a diameter of 60 μm or less, or a stripe pattern with a width of 60 μm or less, said adhesive material contains spacers, and said spacers are spherical or rod form and have a substantially uniform diameter of 1 to 4 μm through the circular cross section.

4,983,430

FIBER REINFORCED COMPOSITE PRODUCT HAVING A HOLLOW INTERIOR

Leigh R. Sargent, 4345 Applecross Dr., Indianapolis, Ind. 46254

Filed Mar. 21, 1989, Ser. No. 326,303
Int. Cl.[5] B60B *5/02;* **B29C** *43/20*
U.S. Cl. 428—34.1 **16 Claims**



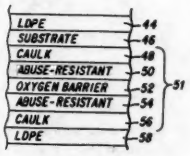
1. A hollow reinforced composite product comprising:
a tubular body composed of a reinforced composite material having a pair of opposite ends, said opposite ends being in overlapping engagement to close said tubular body to form an annular configuration, and further having an opening therethrough proximate to one of said opposite ends;
said tubular body manufactured by a process including the steps of
(a) providing a tubular body including a reinforcement and providing a tubular shaped bladder;
(b) inserting said bladder inside said tubular body so that the ends of said bladder extend outside the said opposite ends of said tubular body;
(c) forming an opening in the side of said tubular body at a location spaced apart from said one of said opposite ends thereof;
(d) passing a first end of said bladder through said side opening;
(e) passing a second end of said bladder into said one of said opposite ends of said tubular body and through the side opening;
(f) overlapping said opposite ends of said tubular body to form a hollow continuous preform having said annular configuration;
(g) sealing one of the ends of said bladder;
(h) placing the preform into a mold; and
(i) molding the preform into a desired shape by curing the preform within said mold while inflating said bladder.

4,983,431

OXYGEN IMPERMEABLE LEAK FREE CONTAINER

Charles E. Gibbons; Gerald A. Marano; James M. Kittrell; Allan A. Whillock; Robert L. Lanham, all of Mobile, and Donald Evans, South Mobile, all of Ala., assignors to International Paper Company, Tuxedo Park, N.Y.

Filed May 22, 1989, Ser. No. 354,571
Int. Cl.[5] B65D *5/56;* **B32B** *27/10*
U.S. Cl. 428—34.2 **24 Claims**



1. An oxygen barrier laminate structure for producing an oxygen impermeable leak free container comprising:
(a) a mechanically stable structural substrate having an inner and an outer surface;
(b) an outer layer of a heat-sealable polymer material coated on the outer surface of said mechanically stable structural substrate;
(c) a sandwich layer of: a first caulking polymer resin layer, a first layer of an abuse-resistant polymer resin layer, an oxygen barrier material layer, a second layer of an abuse-resistant polymer resin layer, a second layer of a caulking polymer resin, all coextruded in that sequence onto the interior surface of said mechanically stable structural substrate; and
(d) an inner heat-sealable product contact polymer material layer extrusion coated on the inner surface of the second caulking polymer resin layer of the inner sandwich, which is heat-sealable with the outer layer of polymer material on conventional equipment at temperatures ranging from 250° F. to 500° F. and wherein said first and second caulking polymer resins are selected from the group consisting of zinc salts of ethylene methacrylic acid copolymers, sodium salts of ethylene methacrylic acid copolymers, ethylene acrylic acid copolymers, ethylene methacrylic acid copolymers, ethylene vinyl acetate copolymers, ethylene methacrylate copolymers and ethylene based graft copolymers.

4,983,432

ETHYLENE VINYL ALCOHOL COPOLYMERS CONTAINING PLATELET-TYPE MICA FILLERS OF MULTI-LAYER CONTAINERS

Thomas C. Bissot, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 79,471, Jul. 30, 1987, Pat. No. 4,818,782.
This application Dec. 20, 1988, Ser. No. 286,784
Int. Cl.[5] B32B *5/22, 27/08, 5/16;* B27N *5/02*
U.S. Cl. 428—35.7 9 Claims

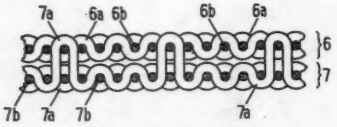
1. A multilayer structure comprising a first layer of structural thermoplastic polymer and a second layer of a composition comprising 50 to 95 percent by weight of an ethylene/vinyl alcohol copolymer having an ethylene content of 20 to 60 mole percent, a melt flow rate of from 0.1 to 100 g/10 minutes as measured at 210° C., and 50 to 5 percent by weight of mica wherein at least 95% by weight of the mica particles have a particle size of less than 38 microns, a platelet like shape and an aspect ratio of 10 to 150.

4,983,433

FIBER REINFORCED PLASTIC AND ITS REINFORCEMENT

Yoshikazu Shirasaki, Otsu, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 26, 1989, Ser. No. 457,156
Claims priority, application Japan, Dec. 26, 1988, 63-330024
Int. Cl.[5] B32B *1/08*
U.S. Cl. 422—36.1 7 Claims



1. A fiber reinforced plastic comprising:
(1) a first reinforced resin layer reinforced with a reinforcement, which comprises a mixed-woven or knitted fabric of two kinds of filmaments, one kind of filament thereof being an ultra high molecular weight polyethylene filament having tensile strength of not less than 20 g/denier and tensile modulus of not less than 500 g/denier, the ultra high molecular weight polyethylene filament material occupying 60 to 90% of the total surface area of said fabric, and the other filament being an inorganic fiber occupying 60 to 90% of the total back surface area of said fabric, and a matrix resin, and
(2) a second reinforced resin layer reinforced with an inorganic fiber and a matrix resin,
said first reinforced resin layer being laminated on at least one surface of said second reinforced resin layer in such a manner that the back surface of said first reinforced resin layer faces to said second reinforced resin layer.

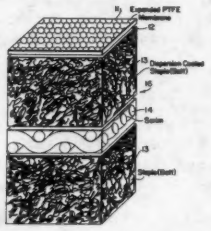
4,983,434

FILTER LAMINATES

Robert L. Sassa, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 385,066, Apr. 7, 1989. This application Sep. 25, 1989, Ser. No. 411,941
Int. Cl.[5] B01D *39/16, 46/04;* B32B *5/26, 5/32*
U.S. Cl. 428—36.2 10 Claims

1. A laminate comprising:
(a) an expanded porous polytetrafluoroethylene membrane having an air permeability of at least 0.01 cubic feet per square foot at 0.5 inch water gauge;



(b) a felt comprising a web of polytetrafluoroethylene staple fiber supported by a woven scrim of polytetrafluoroethylene.

4,983,435

ADHESIVES

Toru Ueki; Hajime Sentoku, both of Kanagawa; Takashi Miyazaki, Tokyo, and Eiichi Sugihara, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 31, 1988, Ser. No. 266,643
Claims priority, application Japan, Aug. 10, 1988, 63-197864
Int. Cl.[5] B32B *1/02, 27/28;* C08L *51/06, 23/10*
U.S. Cl. 428—36.6 4 Claims

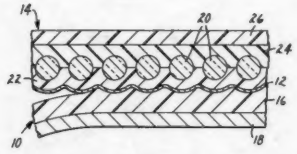
1. An adhesive used between a polypropylene layer and an ethylene/vinyl alcohol copolymer layer, which adhesive comprises (A) 98.9 to 59.9% by weight of a modified polypropylene partly or fully grafted with an unsaturated carboxylic acid or its derivative, (B) 1.0 to 40% by weight of an ethylene/α-olefin copolymer having a density of 0.915 to 0.940 g/cc, and a melting point of 115° to 130° C., and (C) 0.1% by weight or more but less than 3% by weight of a hydrocarbon type synthetic elastomer.

4,983,436

RETROREFLECTIVE SHEETING WITH BACKING FILM

Terry R. Bailey; Howard R. Tolliver, both of Woodbury; Douglas C. Degler, White Bear Lake, and Dennis J. Chirhart, West St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 15, 1987, Ser. No. 38,639
Int. Cl.[5] B32B *15/08;* G02B *5/128*
U.S. Cl. 428—40 33 Claims



1. A retroreflective sheeting comprising:
(A) transparent microspheres, arranged in substantially a monolayer;
(B) a transparent spacing layer which said microspheres are supported by and at least partially embedded in;
(C) a specularly reflecting layer underlying said spacing layer; and
(D) a backing film;
wherein said backing film comprises at least a self-adherent layer which is self-adhered directly to the rear side of said specularly reflecting layer, said self-adherent layer having

been preformed prior to lamination to said specularly reflecting layer or having been extruded onto said specularly reflecting layer, said self-adherent layer being thermoplastic and having a melt index of less than about 500 and comprising:

polyethylene; or

one or more copolymers comprising by weight a major portion of at least one of ethylene or polyethylene, and a major portion of at least one of ethylene or propylene, and a minor portion of at least one polar comonomer; or

a blend comprising (a) one or more other polymers and (b) one or more of said copolymers or polyethylene or combinations of said copolymers or polyethylene, said blend comprising a major portion by weight of ethylene and/or propylene,

wherein the tensile strength of said retroreflective sheeting is substantially increased by said self-adherent layer.

4,983,437

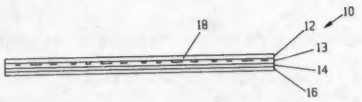
COMPACT DISC PROTECTOR

Steven L. Merrick, 3209 W. 76th St., Edina, Minn. 55435

Filed Apr. 21, 1989, Ser. No. 341,625

Int. Cl.[5] B32B *7/06, 7/10*

U.S. Cl. 428—40 **1 Claim**



1. Compact disc protector for protecting a top surface containing information and a reflective surface embedded within a compact disc comprising in order:

a. a thin, transparent, scratch-resistant polymer layer with a diameter slightly less than the outer diameter of the compact disc and having an inner hole slightly larger than the inner hole of the compact disc;

b. information or graphics printed onto said polymer layer;

c. ultra violet protection coating to reduce damage caused by natural or artificial light coated onto said polymer layer;

d. a pressure sensitive adhesive coated over said ultraviolet protector; and

e. peel-away backing affixed to said pressure sensitive adhesive for subsequent end user application.

4,983,438

MULTI-PLY FORM WITH ATTACHED LABELS AND MULTIPLE FORM PARTS

John R. Jameson, St. Charles, Mo., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 315,821, Feb. 27, 1989, Pat. No. 4,910,058. This application Dec. 18, 1989, Ser. No. 451,932

Int. Cl.[5] B32B *7/06*

U.S. Cl. 428—42 **26 Claims**

1. A multi-ply form having multiple form parts and labels for removal from the form and adhesion to various surfaces comprising:

first and second webs, said first web having first and second portions;

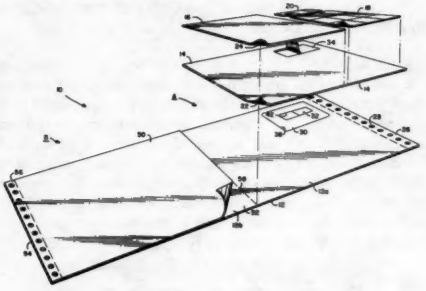
a repositionable adhesive on said second web releasably securing said second web to the first portion of said first web;

a plurality of labels;

permanent adhesive carried by said labels releasably securing said labels to said second web on a side thereof remote from said first web portion;

whereby, upon removal of said first web portion from said second web, said second web and labels carried thereby may be releasably secured to a first surface by said repositionable adhesive, and upon removal of at least one of said labels from said form, said one label may be secured to a second surface;

first and second superposed form parts with said first form part constituting said second portion of said first web;



means securing said first and second form parts one to the other; and

means for releasably securing said first form part to said first web portion whereby said second form part is generally co-planar with said second web.

4,983,439

METHOD OF MANUFACTURING A RECORDING MEDIUM AND RECORDING MEDIUM

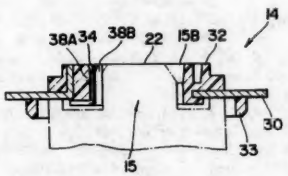
Hitoshi Saito, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 9, 1989, Ser. No. 349,550

Claims priority, application Japan, May 12, 1988, 63-62466[U]; May 12, 1988, 63-115488

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—64 **6 Claims**



1. A recording medium including a center core formed with a center hole for a rotary drive shaft in the central portion of a recording disc, characterized in that in the inner peripheral surface of said central hole in said center core there is provided a positioning surface for alignment with which the peripheral surface of said rotary drive shaft can be brought into contact, that there are formed a pair of slits facing said center hole in said center core and disposed on the opposite side to said positioning surface and into said pair of slits there are inserted the two ends of a plate-shaped resilient member for pushing said rotary drive shaft against said positioning surface, and that in said plate-shaped resilient member there is provided a projected portion for securement and in said center core there is provided a securing means for securing said projected portion.

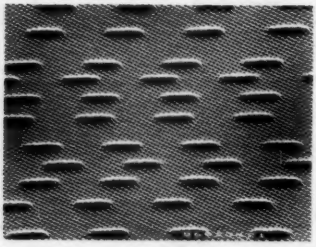
4,983,440

OPTICAL RECORDING MEDIUM AND RECORDING PROCESS UTILIZING THE SAME

Minoru Ikeda, Kurashiki; Koichi Saito, Okayama, and Hideki Kobayashi, Kurashiki, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed May 31, 1988, Ser. No. 200,435
Claims priority, application Japan, May 30, 1987, 62-135556; May 30, 1987, 62-135558
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 29 Claims

1. An optical recording medium, comprising a transparent plastic substrate having a surface of minutely roughened structure and a thin metal film formed on said substrate, said optical recording medium being capable of absorbing laser light of a specific wavelength region and undergoing a change in the structure by the action of the laser light, thereby recording data on a medium, and wherein said thin metal film comprises a metal of the platinum group and a second metal or semi-metal such that the thermal conductivity of said thin metal film is not



higher than 80% of the thermal conductivity of the platinum group pure metal, wherein said transparent plastic substrate has a surface of regularly roughened structure having a regular pitch and a depth of 0.01 to 1 μm, wherein said regular pitch measured in the direction parallel to the average surface level is smaller than said wavelength of said laser light, and wherein said second metal or semi-metal is selected from the group consisting of bismuth, titanium, aluminum, selenium, tellurium, silicon, germanium and tin.

4,983,441

DEODORANT COMPOSITION AND DEODORANT COMPOSITE MATERIAL

Yoshiaki Miki, Yokohama; Tsunehisa Ueda, Zushi, and Tadao Natsuume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 118,884, Nov. 10, 1987, Pat. No. 4,906,462. This application Aug. 23, 1989, Ser. No. 397,512
Claims priority, application Japan, Nov. 14, 1986, 61-271224; Jun. 30, 1987, 62-161195; Aug. 6, 1987, 62-196641
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—65 15 Claims

10. The deodorant composite material of claim 1 wherein the copper compound is selected from the group consisting of inorganic acid salts, organic acid salts, complexes and oxides of copper.

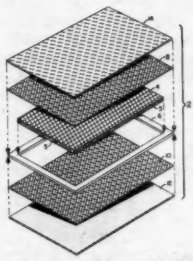
4,983,442

COMPOSITE ARTICLE AND METHOD OF MAKING SAME

Tushar M. Patel, Utica, and Richard E. Berg, Port Huron, both of Mich., assignors to United Technologies Automotive Inc., Dearborn, Mich.

Filed Jul. 13, 1990, Ser. No. 553,197
Int. Cl.[5] B32B *1/04, 3/02, 3/26, 31/00*
U.S. Cl. 428—74 11 Claims

1. A composite article comprising a core of fiberglass mattes impregnated with a thermoplastic resin binder having adjacent to one or more of said matte's edges a strip of semi-rigid urethane foam and having one or more reinforcing layers bonded



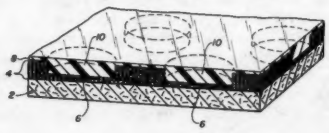
to at least one of the core surfaces to form a unitary composite article.

4,983,443

EMBOSSED AND WIPED DECORATIVE SURFACE COVERINGS

Richard H. Balmer, Manheim; Martin Dees, Jr., Landisville, and Frank G. Drout, Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 12, 1988, Ser. No. 231,366
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—158 25 Claims



1. A decorative surface covering product comprising:
(a) a first layer of fused PVC material, and
(b) a second layer of cured transparent or translucent thixotropic plastic material substantially covering said first layer, said second layer having a element extending into said first layer.

24. A decorative surface covering product comprising:
(a) a first layer of granular, PVC material, and
(b) a second layer of cured plastic material substantially covering said first layer, a portion of said second layer material filling the interstices between the granular material of the first layer, said PVC material and said second layer material in the interstices being fused.

4,983,444

THERMOSENSITIVE IMAGE TRANSFER RECORDING MATERIAL

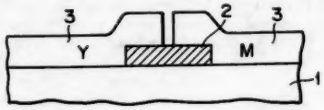
Youji Ide, Mishima, and Tetsuji Kunitake, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 235,521, Aug. 24, 1988, abandoned. This application Feb. 1, 1990, Ser. No. 472,432
Claims priority, application Japan, Aug. 31, 1987, 62-215123
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—195 17 Claims

1. A thermosensitive image transfer recording material comprising:
a ribbon-shaped substrate,
a plurality of thermosensitive image transfer layer sections

formed on said substrate, each thermosensitive image transfer layer section having a different color, which are sequentially disposed in the longitudinal direction of said substrate, and

a plurality of marker layer sections for optically detecting the color of any of the thermosensitive image transfer layer sections adjacent to said marker layer section, each of which marker layer sections extends across the entire



width of the recording substrate and is disposed in the boundary regions between said thermosensitive image transfer layer sections in such a configuration that at least part of the surface of each marker section is covered by at least one of the two thermosensitive image transfer layer sections adjacent to said marker layer section, with the entire surface of said substrate being completely covered by said image transfer layer sections and said marker layer sections.

4,983,445

THERMAL PRINTING RIBBON

Seiji Ueyama, Hirakata, Japan, assignor to General Company Limited, Osaka, Japan

Continuation of Ser. No. 894,213, Aug. 7, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 291,371

Claims priority, application 8121985, Aug. 12, 1985, 60-175799; Japan, Aug. 12, 1985, 60-175800

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—212 **13 Claims**

1. A thermal printing ribbon which comprises a heat-resistant substrate, a heat-sensitive releasing layer and a heat-sensitive transferring ink layer laminated in this order, the heat-sensitive transferring ink layer consisting essentially of

(a) a polyethylene resin having a melting point or softening point of 60°–150° C., molecular weight of 1,000–100,000, penetration of 20 or less (at 25° C.) (JIS K 2235) and melting viscosity of 100–10,000 cps (at 140° C.),

(b) a wax having a melting point of 50°–110° C. and

(c) a coloring agent, and the contents of (a), (b) and (c) components being 50–80 % by weight, 0–30% by weight and 5–45% by weight after drying, respectively.

4,983,446

THERMAL IMAGE TRANSFER RECORDING MEDIUM

Keishi Taniguchi, Susono, and Junko Yamaguchi, Shizuoka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,830

Claims priority, application Japan, Jan. 28, 1988, 63-15897; Apr. 1, 1988, 63-77995; Jun. 30, 1988, 63-160996

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—216 **14 Claims**

1. A thermal image transfer recording medium comprising a substrate and a thermally transferrable ink layer formed thereon comprising as the main components a carbon black and a fusible saturated linear polyester resin, further comprising a peel-off layer between said substrate and said thermally transferrable ink layer, wherein said peel-off layer is made of a thermofusible material having a differential thermal analysis peak at 120° C. or less selected from the group consisting of beeswax, whale wax, candelilla wax, carnauba was, rice bran wax, montan wax, ozocerite wax, paraffin wax and microcrystalline wax.

4,983,447

BIAXIALLY ORIENTED OPAQUE POLYOLEFIN MULTI-LAYER FILM

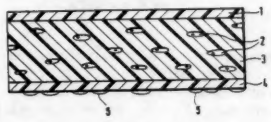
Guenther Crass, Taunusstein; Siegfried Janocha, Wiesbaden, and Lothar Bothe, Mainz-Gonsenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,448

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631231

Int. Cl.[5] B32B *27/08;* B29C *45/16*

U.S. Cl. 428—216 **19 Claims**



1. A biaxially oriented opaque polyolefin multilayer film which can be sealed on both sides, comprising a base layer and two surface layers, one on each side of the base layer, the base layer comprising a propylene polymer with an additive that is incompatible with the propylene polymer, a first surface layer comprising a polyolefinic sealable raw material containing a polydialkylsiloxane incorporated within the layer as a lubricant, and a second surface layer consisting essentially of a sealable polyolefinic material having, on its outer surface, polydialkylsiloxane as a lubricant, in a relative occupancy of not more than about 15, as determined with the aid of ESCA spectroscopy, wherein said second surface layer has been subjected to corona discharge and is printable.

4,983,448

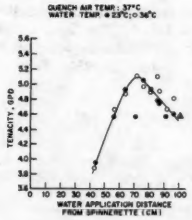
POLYAMIDE FILAMENTS HAVING IMPROVED PROPERTIES AND METHOD OF PREPARATION

Theodore G. Karageorgiou, Arden, N.C., assignor to BASF Corporation, Williamsburg, Va.

Filed Jun. 7, 1988, Ser. No. 203,659

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—224 **6 Claims**



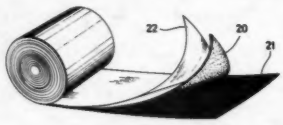
1. A polycaprolactam filament characterized by a birefringence in the range of from about 0.0385 to about 0.0405, an α-crystal content greater than 30 percent, and a tenacity of at least 4.6 and up to about 5.1 grams per denier.

4,983,449

PROTECTIVE WRAPPING MATERIAL

Robert M. Nee, Houston, Tex., assignor to Polyguard Products Incorporated, Ennis, Tex.

Filed Sep. 27, 1989, Ser. No. 413,129
Int. Cl.[5] B32B 7/00
U.S. Cl. 428—252 8 Claims



1. A continuous non-shielding strip protective wrapping for buried pipe consisting essentially of:

(a) a substantially non-elastic support backing comprising a continuous strip of porous material comprising a basket weave fabric of essentially flat thermoplastic fibers which has an open surface area of not more than twenty percent; and

(b) a layer of cold-flowable rubberized bitumen secured to at least one side of said support backing.

4,983,450

GAS-PERMEABLE, WATERPROOF NONWOVEN FABRIC AND PROCESS FOR ITS PRODUCTION

Takeshi Yanagihara; Tsugio Honda; Makoto Nakano, and Hiroshi Kajino, all of Kanagawa, Japan, assignors to Mitsue Toatsu Chemicals, Inc., Tokyo and Uni-Charm Corporation, Kawanoe, both of, Japan

PCT No. PCT/JP87/00889, § 371 Date Jul. 28, 1988, § 102(e) Date Jul. 28, 1988, Pub. PCT No. WO88/03870, PCT Pub Date Jun 2, 1988
Filed Jul. 28, 1988, Ser. No. 251,214
Claims priority, application Japan, Nov. 18, 1986, 61-276191
Int. Cl.[5] B32B 5/16
U.S. Cl. 428—283 8 Claims

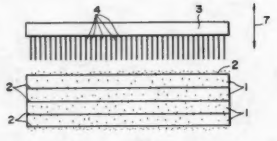
1. A gas-permeable, waterproof nonwoven fabric which comprises a thermoplastic resin composition film comprising 100 parts by weight of a thermoplastic resin and 1 to 50 parts by weight of a filler, said filler being fine particles of an organic resin filler having the particle size of 1 to 50 microns selected from the group consisting of thermoplastic resins and thermosetting resins, and a nonwoven fabric, said thermoplastic resin composition film having fine pores formed by calendar processing.

4,983,451

CARBON FIBER-REINFORCED CARBON COMPOSITE MATERIAL AND PROCESS FOR PRODUCING THE SAME

Morihiko Sugino, and Yoshio Inoue, both of Hyogo, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 4, 1988, Ser. No. 177,082
Claims priority, application Japan, Aug. 5, 1987, 62-195741
Int. Cl.[5] B32B 5/16
U.S. Cl. 422—283 10 Claims



1. A process for producing a carbon fiber-reinforced carbon composite material, which comprises layering non-woven fabrics of carbon fiber or a blend of carbon fiber and organic fiber, which have been coated with a filler containing liquid, to obtain a layered material; and

needle punching said layered material with a plurality of needles, to obtain a prepreg of three-dimensional structure;

wherein said filler-containing liquid comprises a synthetic resin liquid and at least one filler selected from the group consisting of graphite powder, carbon black powder, carbon short fiber, graphite short fiber, synthetic resin powder, pitch powder, mesophase pitch powder, coke powder, ceramic powder, metal powder, metal short fiber, Si_3N_4 whiskers, SiC whiskers, and ceramic short fibers.

4,983,452

ELECTROCONDUCTIVE THERMOPLASTIC SHEET AND METHOD OF FORMING SAME

Takashi Daimon, and Hideshi Sakamoto, both of Ichihara, Japan, assignors to Chisso Corporation, Japan

Filed Jul. 19, 1988, Ser. No. 221,365
Claims priority, application Japan, Jul. 22, 1987, 62-182874
Int. Cl.[5] B32B 27/34
U.S. Cl. 428—287 18 Claims

1. An electroconductive thermoplastic integrally laminated sheet comprising:

(a) a thermoplastic sheet;

(b) an electroconductive nonwoven fabric formed from electroconductive fibers irregularly intertwined with hot-melt adhesive fibers, said electroconductive nonwoven fabric being superposed on at least one surface of said thermoplastic sheet; and

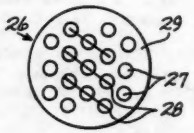
(c) a nonwoven fabric formed from said hot-melt adhesive fibers superposed upon the outer surface of said electroconductive nonwoven fabric.

4,983,453

HYBRID PULTRUDED PRODUCTS AND METHOD FOR THEIR MANUFACTURE

Frank C. Beall, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 93,323, Sep. 4, 1987, abandoned. This application Jan. 2, 1990, Ser. No. 462,300
Int. Cl.[5] B32B 5/28, 29/02
U.S. Cl. 428—294 21 Claims



1. A composite pultruded product consisting essentially of a plurality of longitudinally oriented essentially parallel glass roving strands; and a parallel oriented cellulosic mat interlayered between the roving strands, both the roving strands said cellulosic mat having a moisture content of 3% or less, and cellulosic mat being completely saturated with and enclosed within a resin matrix, wherein the glass roving strands comprise from 10–45%, the cellulosic mat from 4–40%, and the resin 40–70 % of the product, all measured by volume.

4,983,454

PROCESS FOR COATING METALLIC SUBSTRATE

Tadayoshi Hiraki; Osamu Iwase; Hiroi Oosumimoto; Shinji Sugiura; Ichiro Tabushi; Masafumi Kume; Takashi Udagawa; Komaharu Matsui, and Yasuhiro Fujii, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 907,212, Sep. 12, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 296,342

Claims priority, application Japan, Sep. 17, 1985, 60-205065

Int. Cl.[5] C25D *13/06*

U.S. Cl. 428—335 22 Claims

1. A process for coating a metallic substrate, which comprises applying on a metallic substrate an electrocoating paint, applying thereon a barrier coat comprising a film-forming thermoplastic resin other than a modified polyolefin resin and capable of forming a barrier coat film having a static glass transistion temperature of −30° to −60° C. and an elongation at break of 300 to 800% in an atmosphere of −20° C., said thermoplastic resin being at least one film-forming thermoplastic resin selected from the group consisting of styrene-butadiene copolymers, polybutadienes, acrylonitrile-butadiene copolymers, polybutenes, acrylic resins, natural rubber, polychloroprenes, methyl methacrylate-butadiene copolymers and polyvinylidene chlorides, applying on said barrier coat an intermediate coating paint and then applying thereon a top coating paint, the film thickness of the barrier coat being 1 to 20 μ in terms of the thickness of the dried film, and the acrylic resins being copolymers of at least one monomer selected from the group consisting of acrylic esters and methacrylic esters, each of homopolymers of the acrylic esters and the methacrylic esters having a static glass transition temperature of 0° C. or lower, and the amount of these esters whose homopolymers have a static glass transition temperature of −40° C. or lower constituting 60% by weight or more of the total monomer mixture.

4,983,455

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

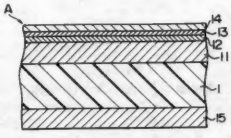
Kunio Wakai, Kitasoma, and Tetsuo Mizumura, Toride, both of Japan, assignors to Hitachi Maxell, Ltd., Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,483

Claims priority, application Japan, Feb. 14, 1987, 62-31893; Sep. 19, 1987, 62-236036; Oct. 9, 1987, 62-253823; Oct. 16, 1987, 62-259500

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—336 17 Claims



1. A magnetic recording medium having a ferromagnetic metallic layer provided on a non-magnetic substrate, which comprises an anticorrosive layer having a thickness of 20 to 200Å deposited on said ferromagnetic metallic layer containing a benzotriazole derivative having at least one of amino group, nitro group, chlorine or mercapto group as substituent in the benzotriazole skeleton as a main component.

4,983,456

COMPOSITIONS CONVERTIBLE TO REINFORCED CONDUCTIVE COMPONENTS AND ARTICLES INCORPORATING SAME

Richard S. Iwaskow, Pompton Lakes, and Stephen M. Crum, Wharton, both of N.J., assignors to American Cyanamid

Division of Ser. No. 358,549, Mar. 16, 1982, Pat. No. 4,752,415. This application Nov. 18, 1987, Ser. No. 122,065

Int. Cl.[5] C09J *7/02*

U.S. Cl. 428—254 10 Claims

1. A sheet-like structure comprising a substantially non-conductive polymeric material, and at least one conductive fiber in the plane of the sheet, said fiber said having an electrically conductive non-metallic or semi-metallic core and at least one thin, uniform, firmly adherent, electrically conductive layer of at least one electrodepositable metal thereon, the fiber further defining a continuous electrical pathway ending in at least two terminals.

4,983,457

HIGH STRENGTH, ULTRA HIGH MODULUS CARBON FIBER

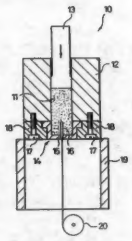
Takashi Hino; Hiroyuki Kurodo, and Kaoru Hirokawa, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 198,959, May 26, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 484,006

Claims priority, application Japan, May 31, 1987, 62-135822

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—367 3 Claims



1. A high strength, ultra high modulus carbon fiber characterized by the presence of the (112) cross lattice line and the resolution of the defraction band into two distinct lines (100) and (101), which indicate the three dimensional order of the crystallite of the fiber; an interlayer spacing (d_{002}) of 3.371 to 3.40 Å; a stack height (Lc_{002}) of 170 to 350 Å; and a layer size ($La_{110}$of 200 to 450 Å, wherein said carbon fiber as a tensile strength of 3.0 GPa or more and a modulus of elasticity of 600 GPa or more.

4,983,458

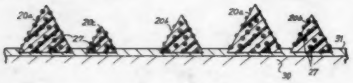
REFLECTIVE PARTICLES

Robert Dejaiffe, Oak Ridge, N.J., assignor to Potters Industries, Inc., Parsippany, N.J.

Continuation of Ser. No. 653,943, Sep. 21, 1984, abandoned. This application Oct. 2, 1986, Ser. No. 914,329

Int. Cl.[5] G02B *5/128;* E01C *23/16;* F21V *7/22;* C08J *9/32*

U.S. Cl. 428—402 1 Claim



1. A multiplicity of small reflective particles comprising tetrahedron-shaped granules of plastic material, and a plurality of glass spheres substantially evenly dispersed throughout each granule with some of the spheres protruding through the outer surface thereof, the proportion of said spheres to the granule material being about 30 to 60 percent by weight for each granule, each of the granules having a plurality of flat faces which meet at an acute angle to form a straight abrupt edge, the granules being of a size and shape such that when dropped from a random position onto a horizontal tacky surface a flat face of all of the granules sinks into said surface in facing contact therewith, the abrupt edges of all of the granules forming wedges to hold the granules in place on said surface.

4,983,459

CHEMICALLY REACTED GLASS SURFACE

Helmut Franz, Pittsburgh, and George B. Goodwin, Mars, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 3, 1990, Ser. No. 503,587

Int. Cl.[5] B32B *17/00*

U.S. Cl. 428—410 10 Claims

1. An article comprising a glass substrate at least a portion of the surface of which is treated with a composition comprising:

a. a perfluoroalkyl alkyl silane; and

b. a fluorinated olefin telomer.

4,983,460

FILMS HAVING IN THEIR THICKNESS AT LEAST TWO SUPERIMPOSED ZONES, INCLUDING AN INSULATING ZONE AND A CONDUCTIVE ZONE, AND THE PRODUCTION THEREOF BY IRRADIATING A POLYMER FILM BY MEANS OF A BEAM OF HIGH ENERGY IONS

Emmanuel Balanzat, Chen; C. Boiziau, Massy; Charles Darnez, Bordeaux; Jean-Paul Duraud, Ivry S/Seine, and Alain Le Moel, Chaville, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

PCT No. PCT/FR87/00380, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/02692, PCT Pub. Date Apr. 21, 1988

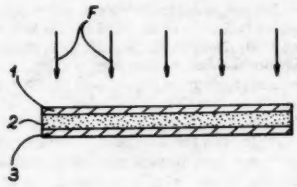
PCT Filed Oct. 6, 1987, Ser. No. 218,287

Claims priority, application France, Oct. 10, 1986, 86 14111

Int. Cl.[5] B32B *27/00*

U.S. Cl. 428—421 5 Claims

1. A film, having in its thickness, a structure constituted successively of a first semi-metallic layer, a second electrically insulating layer and a third semi-metallic layer, said electrically insulating layer being constituted of an organic polymer and the semi-metallic layers being constituted of a derivative of said organic polymer and the structure of said film being formed by subjecting said film to ion radiation which has



sufficient energy to allow the ions to pass completely through the polymer film.

4,983,461

SCRATCH-RESISTANT AND ABRASION-RESISTANT TRANSPARENT POLYURETHANE FILM WITH ENERGY-ABSORBING AND ANTIFOGGING PROPERTIES, PROCESS OF PRODUCTION, AND WINDOW PANES USING IT

Gérard M. Daude, Villenave D'Ornon, and Jean-Louis M. Bravet, Thourotte, both of France, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed May 22, 1989, Ser. No. 354,759

Claims priority, application France, May 20, 1988, 88 06779

Int. Cl.[5] B05D *1/02;* B32B *27/40, 17/10*

U.S. Cl. 428—423.1 16 Claims

1. A process of producing a transparent polyurethane film of high optical quality which is a useful component of safety glass as an external film, having energy-absorbing properties and whose scratch-resistance and abrasion resistance is improved by surface treatment, which comprises:

applying onto an exposed surface of a substrate, by reactive casting or reactive spraying, a reaction mixture of an isocyanate component and a polyol component containing at least one long difunctional polyol having a molecular weight between 500 and 10,000, containing at least partial ethylene oxide segments, with the percentage by weight of ethylene oxide segments relative to the total weight of the polyurethane being greater than 20%, at least one short diol as chain extender, with the ratio of free NCO groups of the isocyanate component to free OH groups of the polyol component being between the 1.5 and 2;

contacting the exposed surface of the applied material intended to face toward the outside of the safety glass with a surface treatment compound of an acrylic derivative or isocyante having a functionality greater than 2;

polymerizing the materials of the applied reaction mixture and the surface treatment compound; and

removing the polymerized polyurethane layer and the attached polymerized surface material from said substrate.

4,983,462

METHOD FOR PREPARING ALUMINUM NITRIDE AND ITS SINTER

Atsuhiko Hisi, Takaishi; Kazuo Wakimura, Sennan; Masao Tanaka, Sakai, and Takao Tanaka, Shimonoseki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 226,021, Jul. 29, 1988, Pat. No. 4,869,925. This application Aug. 14, 1989, Ser. No. 393,493

Claims priority, application Japan, Jul. 29, 1987, 62-187703; Apr. 1, 1988, 65-78188; Apr. 1, 1988, 63-78189

Int. Cl.[5] B32B *17/06*

U.S. Cl. 428—432 10 Claims

1. An aluminum nitride sinter shaped material, prepared by a process which comprises the steps of (a) reacting an organic aluminum compound with an aminotriazine in a solvent to obtain an aluminum nitride precursor, (b) separating the alumi-

num nitride precursor from the solvent, (c) heating/calcining the aluminum nitride precursor first in a reducing gas atmosphere at a temperature of 600°–1,300° C. and then successively in an inert gas atmosphere at a temperature of 1,400°–1,650° C., to produce aluminum nitride powder having a carbon content of not more than 0.2% by weight, (d) molding the aluminum nitride powder into a desired shape, and (e) then sintering the thus-shaped material.

4,983,463

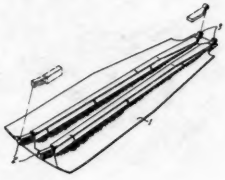
HYBRID COMPOSITE STRUCTURES OF FIBER REINFORCED GLASS AND RESIN MATRICES

Eric Minford, South Windsor; Karl M. Prewo, Vernon, both of Conn., and Robert J. Miller, North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 84,368, Aug. 12, 1987. This application Oct. 13, 1988, Ser. No. 257,480

Int. Cl.[5] B32B *17/10, 7/04*

U.S. Cl. 428—435 1 Claim



1. A hybrid composite external flap for a gas turbine engine, comprising:

an elongated graphite fiber reinforced polyimide matrix composite body extending from a forward end to an aft end and having an outer surface and an opposite inner surface,

two graphite fiber reinforced borosilicate glass matrix composite forward attachment inserts, integrally bonded to the forward end of the body, and

two graphite fiber reinforced borosilicate glass matrix aft attachment inserts, each integrally bonded to the aft end of the body, wherein the forward and aft attachment inserts provide localized abrasion resistant regions whereby the hybrid composite external flap may be attached to a gas turbine engine.

4,983,464

ANTI-FIRE GLAZING

Gerhard Holzer, and Udo Gelderie, both of Aachen, Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Courbevoie, France

Filed Dec. 30, 1988, Ser. No. 292,337

Int. Cl.[5] B32B *17/10*

U.S. Cl. 428—442 4 Claims

1. An anti-fire glazing comprised of at least two sheets of glass between which is an aqueous gel comprising a cross-linked polyvinyl alcohol of average molecular weight between about 18,000 g/mol and 2224,000 g/mol and a salt that is soluble in said aqueous gel wherein when the molecular weight is 18,000, said cross-linked polyvinyl alcohol does not exceed 40% by weight and when the molecular weight is 224,000 it does not exceed 10% by weight.

4,983,465

THIN FILM MAGNETIC HEAD

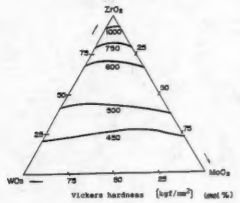
Osamu Shimizu, and Satoshi Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1989, Ser. No. 413,503

Claims priority, application Japan, Oct. 4, 1988, 63-249056

Int. Cl.[5] G11B *5/22*

U.S. Cl. 428—472 9 Claims



1. A thin film magnetic head comprising:

a substrate,

a lower magnetic layer, an insulating layer, an upper magnetic layer, and a protective layer, in this order, on at least a portion of the substrate, said protective layer being formed on said upper magnetic layer and having an end face exposed to a recording medium running surface,

wherein said protective layer consists essentially of 20 to 75 mole % of ZrO_2 and 25 to 80 mole % of one or both of WO_3 and MoO_3.

4,983,466

STAIN AND SCRATCH RESISTANT WEAR LAYER

Jack H. Witman, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jan. 12, 1989, Ser. No. 296,009

Int. Cl.[5] B32B *27/06*

U.S. Cl. 428—483 9 Claims

1. A wear layer for a vinyl surface covering derived from:

(a) an aminoplast,

(b) a polyol,

(c) an acid catalyst, and

(d) a cellulose acetate ester.

4,983,467

COMPACTING OF A METAL WEB PRODUCT MADE

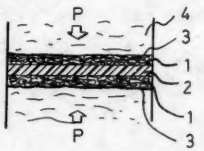
Roger De Bruyne, Zulte; Hervé Schepens, Zwevegem-Otegem; Ignace Lefever, Deerlijk, and Ronny Losfeld, Waregem, all of Belgium, assignors to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Dec. 22, 1988, Ser. No. 288,154

Claims priority, application European Pat. Off., Dec. 29, 1987, 87202635.6

Int. Cl.[5] B23P *17/06*

U.S. Cl. 428—605 9 Claims



1. A method of treating a non-woven metal web, said method comprising the steps of:

(i) sintering said web; and

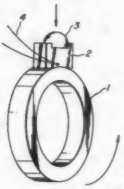
(ii) subsequently isostatically pressing said web.

4,983,468

METALLIC SLIDE MEMBERS TO BE USED WITH CERAMIC SLIDE MEMBERS AND SLIDING ASSEMBLIES USING THE SAME

Isao Oda, Nagoya, Japan, assignor to NGK Insulators Ltd., Japan

Continuation of Ser. No. 70,187, Jul. 6, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 326,515
Claims priority, application Japan, Jul. 11, 1986, 61-162101
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—621 2 Claims



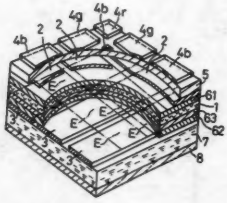
1. A metallic slide member in sliding juxtaposition with a sliding surface of a ceramic member wherein said metallic slide member is capable of forming a metallic lubricating layer on the sliding surface of the ceramic member, whereby when the metallic slide member slides on the sliding surface of said ceramic member, metal is transferred from the metallic slide member to the sliding surface of the ceramic member thereby forming a metallic coat lubricating layer on the sliding surface of the ceramic member, said metallic slide member being made of at least one metallic material selected from the group consisting of Ti-6A1-4V, Ti-2.5A1-13.5Sn, Co-35Mo-10Si, Ni-15Cr-32Mo-3Si, Co-20Cr-10Ni-15W-3Fe-0.1C, Ni-28Cr-20Co-0.1C-2Ti-1A1-1Nb, Fe-0.8C-4Cr-6W-5Mo-2V, Co-32Cr-12.5W-2.4C-0.6Si-2.3Fe-2.3Ni-0.2Mo, Co-29Cr-4W-1.1C-1.2Si-2.3Fe-2.6Ni, and Mo as expressed by weight % in composition.

4,983,469

THIN FILM ELECTROLUMINESCENT ELEMENT

Seizi Huzino, Anjo; Shinya Mizuki; Masumi Arai, both of Nukata, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 118,944, Nov. 10, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,293
Claims priority, application Japan, Nov. 11, 1986, 61-268348; Mar. 3, 1987, 62-48027
Int. Cl.[5] H05B *33/06*
U.S. Cl. 428—690 10 Claims



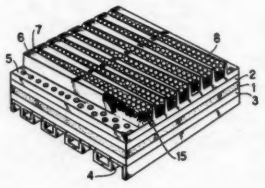
1. A thin film electroluminescent element comprising:
a substrate;
two electrode films, one of said two electrode films being a transparent electrode film formed on a first surface of said substrate and being made of a transparent material; and
a luminescent film formed between said two electrode films for emitting white light through said transparent electrode film upon the application of an electric field between said two electrode films, said luminescent film including three contiguous layers, one layer being formed of a basic material having no luminescent center that is interposed between the other two luminescent layers formed of said basic material and having different luminescent centers.

4,983,470

PROTECTIVE MATERIAL FOR MOLTEN CARBONATE FUEL CELL

Hiroshi Kimura; Kazunao Sato; Mitsuie Matsumura, and Chika Hirai, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 236,732, Aug. 26, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 485,836
Claims priority, application Japan, Aug. 28, 1987, 62-212981; May 7, 1988, 63-110817
Int. Cl.[5] H01M *8/14*
U.S. Cl. 429—16 18 Claims



17. A method of protecting components of a molten carbonate fuel cell from a carbonate electrolyte or a substance formed from a carbonate electrolyte comprising placing in a molten carbonate fuel cell a ceramic formed from an oxide material chemically reactive with a carbonate electrolyte or a substance formed from the electrolyte, the oxide material including at least one substance having a melting point lower than the temperature at which the fuel cell is used.

4,983,471

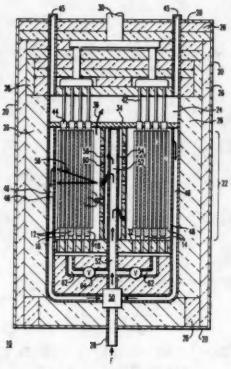
ELECTROCHEMICAL CELL APPARATUS HAVING AXIALLY DISTRIBUTED ENTRY OF A FUEL-SPENT FUEL MIXTURE TRANSVERSE TO THE CELL LENGTHS

Philip Reichner, Plum Borough, and Walter J. Dollard, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 28, 1989, Ser. No. 458,021
Int. Cl.[5] H01M *8/06*
U.S. Cl. 429—19 23 Claims

1. An electrochemical apparatus comprising: (1) an axially elongated generator chamber containing one or more cell bundles, each bundle containing a plurality of parallel, axially elongated electrochemical cells, each cell having an exterior fuel electrode, an interior air electrode, and solid oxide electrolyte therebetween, (2) fresh gaseous feed fuel inlet, (3) gaseous feed oxidant inlet, (4) at least one gaseous spent fuel exit, (5) a combustion chamber, and (6) at least one combusted exhaust gas channel, where a spent fuel exit channel passes from the generator chamber to combine with the fresh feed fuel inlet at a mixing apparatus; a reformable fuel mixture channel passes through the axial length of the generator chamber and connects with the mixing apparatus, said channel containing reformable fuel mixture entry ports along the length of the elec-

trochemical cells within the generator chamber, where the axis of the ports is transverse to the exterior fuel electrode surfaces;



and where a catalytic reforming material is distributed parallel to the axially elongated electrochemical cells.

4,983,472

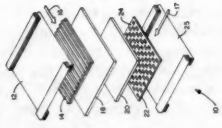
FUEL CELL CURRENT COLLECTOR

Murray Katz, Newington; Stanley P. Bonk, West Willington; Donald L. Maricle, and Martin Abrams, both of Glastonbury, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Nov. 24, 1989, Ser. No. 440,923

Int. Cl.[5] H01M *8/24*

U.S. Cl. 429—38 **19 Claims**



13. A fuel cell comprising:

a plurality of separator plates;

a plurality of anodes;

a plurality of cathodes;

means for supplying reactant between each electrode and separator plate a current collector for location between an electrode and a separator plate;

a plurality of anode current collectors, each for location between each anode and the adjacent separator plate, each anode current collector comprising:

an anode plate having a planar surface adjacent and in contact with an anode;

a plurality of deformed anode collector plate arches formed by deforming plate material and thereby forming a plurality of punched slots in said planar surface, and

each of said deformed anode collector plate arches having a pair of support legs at an obtuse angle with respect to said planar surface an an anode collector beam substantially parallel to said planar surface, the beam of each arch being in contact with the adjacent separator plate.

4,983,473

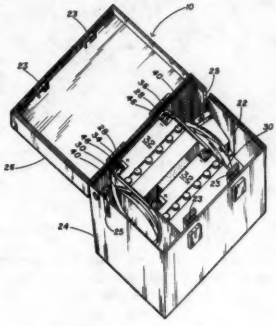
AUXILIARY POWER SOURCE WITH CHARGER AND INTEGRAL LIGHT SOURCE

James L. Smith, 3404 Cranbrook Dr., Fayetteville, N.C. 28301

Filed Jun. 16, 1989, Ser. No. 369,009

Int. Cl.[5] H01M *6/00, 2/26*

U.S. Cl. 429—48 **6 Claims**



1. A portable, lightweight, auxiliary power source for starting a motor vehicle, heavy equipment, or power boat, like having a defective starter battery and comprising:

a generally upright housing defining a chamber and having a bottom section and a closable top section;

a battery means adapted to be received within said chamber, said battery means including a plurality of voltage cells and having a positive terminal and a negative terminal;

a pair of cable means, each of said cable means having a proximal end and a distal end, each of said proximal ends including means for being detachably connected to one of said respective terminals, and each of said distal ends including means for being detachably connected to one of the respective terminals of a defective battery,

said battery means and said cable means being completely storable within said housing when not in use.

4,983,474

HYDROGEN ABSORBING NI-BASED ALLOY AND RECHARGEABLE ALKALINE BATTERY

Hidekazu Doi, Omiya, and Ritsue Yabuki, Iwatsuki, both of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed May 17, 1989, Ser. No. 353,017

Claims priority, application Japan, May 17, 1988, 63-119576; Oct. 18, 1988, 63-262365; Oct. 18, 1988, 63-262366; Jan. 19, 1989, 1-10446; Jan. 19, 1989, 1-10447

Int. Cl.[5] H01M *10/52;* **C22C** *19/03*

U.S. Cl. 429—59 **22 Claims**

1. A hydrogen absorbing Ni-based alloy comprising 5 to 25% by weight of titanium (Ti), 10 to 35% by weight of zirconium (Zr), 4 to 20% by weight of manganese (Mn), 0.1 to 12% by weight of vanadium (V), 0.01 to 5% by weight of iron (Fe), and 0.01 to 4.5% by weight of aluminum (Al).

4,983,475

BAR FOR CONNECTING TOGETHER TWO PLATE STRAPS OF THE SAME POLARITY ON AN ELECTROCHEMICAL BATTERY

Darwin D. Delans, 1184 Dickerson Rd., North Wales, Pa. 19454

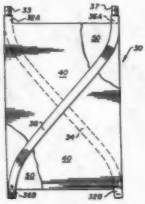
Filed Feb. 13, 1990, Ser. No. 479,174

Int. Cl.[5] H01M *2/20*

U.S. Cl. 429—160 **20 Claims**

1. In an electrochemical battery having a plurality of alter-

nating positive and negative plates immersed in an electrolytic solution, at least one tab protruding from one edge of each of the positive and negative plates, at least one tab protruding from an opposite edge of each of the positive and negative plates, a first negative plate strap means for connecting together each tab protruding from the one edge of each negative plate, a second negative plate strap means for connecting together each tab protruding from the opposite edge of each



negative plate, a first positive plate strap means for connecting together each tab protruding from the one edge of each positive plate, a second positive plate strap means for connecting together each tab protruding from the opposite edge of each positive plate, an improvement comprising:

a first diagonal bar means for connecting together ends of the first and second negative plate strap means; and

a second diagonal bar means for connecting together ends of the first and second positive plate strap means.

4,983,476

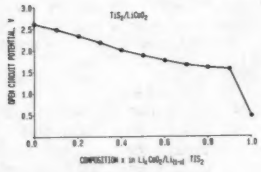
RECHARGEABLE LITHIUM BATTERY SYSTEM

Steven M. Slane, Neptune, and Edward J. Plichta, Howell, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 18, 1990, Ser. No. 539,960

Int. Cl.[5] H01M *6/18*

U.S. Cl. 429—197 **11 Claims**



1. A rechargeable lithium battery system that contains no metallic lithium said system comprising a transition metal sulfide anode, a lithiated transition metal oxide cathode, and a solution of a lithium salt in an aprotic organic solvent as the electrolyte.

4,983,477

CADMIUM NON-SINTERED NEGATIVE ELECTRODE FOR AN ALKALINE STORAGE CELL AND ITS MANUFACTURING METHOD

Masakazu Takemura; Hironori Honda, and Masayuki Terasaka, all of Sumoto, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 16, 1990, Ser. No. 465,685

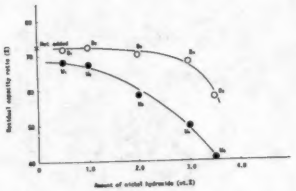
Claims priority, application Japan, Jan. 17, 1989, 1-8365; Feb. 2, 1989, 1-24949; Jun. 19, 1989, 1-156410

Int. Cl.[5] H01M *4/38*

U.S. Cl. 429—222 **9 Claims**

1. A cadmium non-sintered negative electrode for use in an alkaline storage cell, comprising:

a main active material comprising at least one of powdered cadmium oxide and powdered cadmium hydroxide; a reserve charging substance comprising powdered metal cadmium; and



an additive comprising powdered nickel hydroxide whose grain shape is substantially globe.

4,983,478

BURN-IN GUMMING COMPOSITION FOR OFFSET PRINTING PLATES

Paul Stahlhofen, Wiesbaden, and Dieter Mohr, Schlangenbad, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 241,790, Sep. 6, 1988, which is a division of Ser. No. 928,392, Nov. 10, 1986. This application Sep. 27, 1989, Ser. No. 413,304

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1985, 3539992

Int. Cl.[5] G03C *3/00*

U.S. Cl. 430—14 **17 Claims**

1. An offset printing plate, comprising:

a metal support;

an irradiated and developed photosensitive layer on the support; and

a burn-in gumming composition overlying the irradiated and developed offset photosensitive layer for protecting the plate surface during a burning-in step and during long-term storage, comprising an aqueous solution which comprises from about 1 to 50% by weight of a water-soluble polymer or copolymer, wherein the polymer or copolymer comprises monomers selected from the group consisting of styrenesulfonic acid, methylstyrenesulfonic acid, vinylsulfonic acid, acrylamidopropane sulfonic acid, vinyl acetate, and the water-soluble salts thereof.

4,983,479

METHOD OF MANUFACTURING A LAMINATED ELEMENT AND THE ELEMENT THUS OBTAINED

Dirk J. Broer; Jan van der Veen, both of Eindhoven, and Jan Boven, Waalre, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1989, Ser. No. 315,066

Claims priority, application Netherlands, Feb. 29, 1988, 8800512; Nov. 17, 1988, 8802832

Int. Cl.[5] G02F *1/035;* C09K *19/16*

U.S. Cl. 430—20 **9 Claims**

1. A method of manufacturing a laminated element having locally different optical properties comprising

(a) providing a substrate with a coating of a polymerizable liquid-crystalline monomer and an initiator, said monomer having the formula PBNQ where

P is a polymerizable group,

B is a bridging group,

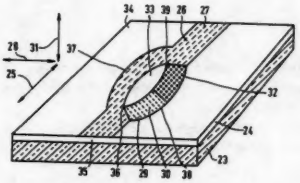
N is a nematic or smectic liquid crystalline group comprising a p-phenylene and/or cyclohexyl group,

Q is the group BP wherein B and P have the above-stated meanings or a substituent selected from the group consisting of hydrogen, halogen, cyano, alkyl of 1–8 carbon

atoms, alkoxy of 1–8 carbons, nitro, amino and a 1–4 carbon alkyl substituted amino,

(b) orienting said monomer by means of an external force,

(c) irradiating said oriented monomer according to a desired pattern to polymerize the monomer and fix the direction



of orientation of the polymerized monomer according to the desired pattern,

(d) changing the direction of the field of force, and

(e) irradiating parts of the monomer previously not irradiating to thereby polymerize said parts and fix the different direction of orientation in these parts.

4,983,480

PHOTOSENSITIVE MEMBER COMPRISING AN AZO COMPOUND

Hideaki Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

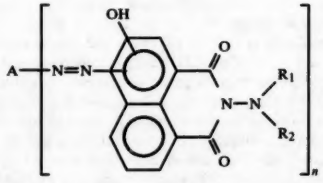
Filed Dec. 28, 1988, Ser. No. 291,208

Claims priority, application Japan, Dec. 29, 1987, 62-334203

Int. Cl.[5] G03G 5/06

U.S. Cl. 430—58 **11 Claims**

1. A photosensitive member with a photosensitive layer comprising an azo compound as a charge generating material represented by the following formula (I) on or over an electrically conductive substrate;



[I]

wherein A represents an aromatic hydrocarbon group or a heterocyclic group, which may be bonded through a bonding group; at least one of R_1 and R_2 is a cyclic group selected from the group consisting of an aryl group which may have a substituent, a condensed polycyclic group which may have a substituent and a heterocyclic group which may have a substituent; or R_1 and R_2 combinedly form a cyclic ring; and n represents an integer of 1, 2, 3 or 4.

4,983,481

ELECTROSTATOGRAPHIC IMAGING SYSTEM

Robert C. U. Yu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 293,165

Int. Cl.[5] G03G 5/047, 5/10

U.S. Cl. 430—59 **18 Claims**

1. A flexible electrophotographic imaging member comprising a flexible supporting substrate layer comprising polyethersulfone, said substrate layer being uncoated on one side and coated on the other side with an electrically conductive layer, an optional adhesive layer, a charge generator layer and a charge transport layer comprising a thermoplastic film forming polymer, said substate layer having a thermal contraction coefficient substantially identical to the thermal contraction coefficient of said charge transport layer.

6. A flexible electrophotographic imaging member according to claim 1 wherein the difference in thermal contraction coefficient between said substrate layer and said charge transport layer is between about -2×10^{-5}/° C. and about $+2\times10^{-5}$/° C. in the temperature range of between about 0° C. and about 150° C.

9. A flexible electrophotographic imaging member according to claim 6 wherein said charge transport layer comprises an organic polymer and an aromatic amine compound having the general formula:

wherein R_1 and R_2 are an aromatic group selected from the group consisting of a substituted or unsubstituted phenyl group, naphthyl group, and polyphenyl group and R_3 is selected from the group consisting of a substituted or unsubstituted aryl group, alkyl group having from 1 to 18 carbon atoms and cycloaliphatic compounds having from 3 to 18 carbon atoms.

4,983,482

PHOTOCONDUCTIVE IMAGING MEMBERS WITH POLYURETHANE HOLE TRANSPORTING LAYERS

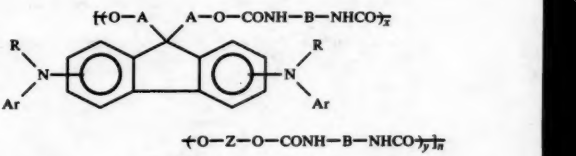
Beng S. Ong; Dasarao K. Murti, both of Mississauga, and Lupu Alexandru, Toronto, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1989, Ser. No. 332,650

Int. Cl.[5] G03G 5/14

U.S. Cl. 430—59 **28 Claims**

1. A layered photoresponsive imaging member comprised of a photogenerating layer, and a hole transporting layer comprised of charge transport polyurethanes of the following formula:



wherein A, B and Z are independently selected from the group of bifunctional linkages; R is an alkyl or aryl group; Ar is an aryl or substituted aryl group; x and y represent mole fraction numbers wherein x is greater than 0 and the sum of x and y is equal to 1.0; and n represents the number of repeating segments.

4,983,483

ORGANIC PHOTORECEPTOR FOR USE IN ELECTROPHOTOGRAPHY EMPLOYING SQUARYLIUM AND COPPER PHTHALOCYANINE AS CHARGE GENERATION MATERIALS

Lii C. Tsai, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, China

Filed Apr. 14, 1989, Ser. No. 339,178

Int. Cl.[5] G03G 5/06

U.S. Cl. 430—59 **9 Claims**

1. A photoreceptor comprising a conductive support, a charge generation layer coated on said conductive support and a charge transport layer coated on said charge generation layer wherein said charge generation layer comprises a polymer

binder and an induced alpha-type charge generation material prepared by milling a mixture of copper phthalocyanine pigment and a squarylium pigment in a weight ratio between 100:3 and 100:30.

4,983,484

ARSENIC-SELENIUM PHOTOSENSITIVE MATERIAL FOR USE IN ELECTRONIC PHOTOGRAPHY

Kazuyuki Urabe, Matumoto, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Dec. 21, 1989, Ser. No. 454,722

Claims priority, application Japan, Dec. 22, 1988, 63-324334

Int. Cl.[5] G03G *5/082*

U.S. Cl. 430—86 **8 Claims**

1. A photosensitive material for use in electronic photography comprising a photosensitive layer which principally comprises an amorphous selenium-arsenic alloy, said alloy having present therein crystalline arsenic trioxide in the form of arsenolite and claudetite, wherein the amounts of arsenolite and claudetite are such that the ratio of the infrared absorbance peak at about 790 cm^{-1} to the peak at about 650 cm^{-1} is at least 0.5.

4,983,485

POSITIVELY CHARGEABLE TONER

Takeshi Nagaoka, Higashi-matsuyama; Takashi Yoshioka, Tsurugashima; Kazuo Kamagata, Hatoyama; Natsuo Sawa, Tadotsu, and Takayuki Murai, Sakado, all of Japan, assignors to Shikoku Chemicals Corporation, Japan

Filed Apr. 11, 1989, Ser. No. 337,902

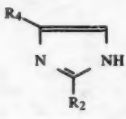
Claims priority, application Japan, Apr. 13, 1988, 63-91989; Apr. 15, 1988, 63-94281; Feb. 13, 1989, 1-34175; Feb. 17, 1989, 1-39143

Int. Cl.[5] G03G *9/00*

U.S. Cl. 430—110 **11 Claims**

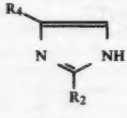
1. A positively chargeable toner comprising, as a charge-controlling agent, at least one compound selected from the group consisting of

(i) an acid adduct of a 2-alkyl imidazole represented by the following formula:



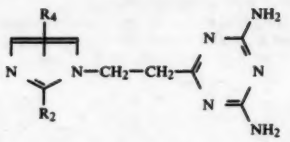
wherein R_2 stands for an alkyl group having 11 through 17 carbon atoms, and R_4 stands for a hydrogen atom or a methyl group;

(ii) a metal complex of a 2-alkyl imidazole represented by the following formula:



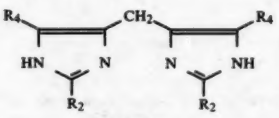
wherein R_2 stands for an alkyl group having 11 through 17 carbon atoms, and R_4 stands for a hydrogen atom or a methyl group;

(iii) a 2,4-diamino-6-imidazolylethyl-s-triazine represented by the following formula



wherein R_2 stands for an alkyl group having 11 through 17 carbon atoms, and R_4 stands for a hydrogen atom or a methyl group; and

(iv) a 4,4'-methylene-bis(2-alkylimidazole) represented by the following formula:



wherein R_2 stands for an alkyl group having 11 through 17 carbon atoms, and R_4 stands for a hydrogen atom or a methyl group.

4,983,486

LIQUID DEVELOPERS FOR ELECTROPHOTOGRAPHY

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 24, 1989, Ser. No. 427,273

Claims priority, application Japan, Oct. 24, 1988, 63-266128

Int. Cl.[5] G03G *9/12*

U.S. Cl. 430—115 **5 Claims**

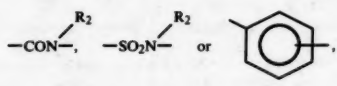
1. A liquid developer for electrostatic photography comprising resin particles dispersed in a non-aqueous solvent whose electrical resistance is at least 10^9 Ω.cm and whose dielectric constant is not more than 3.5, wherein said dispersed resin particles are copolymer resin particles obtained by polymerizing a solution which contains at least one monofunctional monomer (A) which is soluble in said non-aqueous solvent, but which is rendered insoluble by polymerization, and at least one monofunctional macromonomer (B) whose number average molecular weight is not more than 10^4 obtained by bonding a polymerizable double bond group represented by general formula (III):

(III)

wherein T' has the same meaning as T in general formula (II) and d^1 and d^2, which may be the same or different, each has the same meaning as b^1 and b^2 in general formula (II); to only one end of the main chain or a polymer comprising repeating units represented by general formula (II):

(II)

wherein T represents —COO—, —OCO—, —CH_2OCO—, —CH_2COO—, —O—, —SO_2—,



where R_2 represents a hydrogen atom or a hydrocarbyl group which has from 1 to 22 carbon atoms; R_1 represents a hydrocarbyl group which has from 1 to 22 carbon atoms; b^1 and b^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbyl group which has from 1 to 8 carbon atoms, a —COO—R^3 group or a —COO—R^3 group which is linked via a hydrocarbyl group which has from 1 to 8 carbon atoms where R^3 represents a hydrogen atom or a hydrocarbyl group which has from 1 to 18 carbon atoms; in the presence of a resin for dispersion stabilization purposes obtained by bonding a polymerizable double bond group which can be copolymerized with a monofunctional monomer (A) to only one end of the main chain of a polymer containing at least one repeating unit represented by general formula (I):

(I)

wherein X represents —COO—, —OCO—, —CH_2OCO—, —CH_2COO—, —O—, or —SO_2—; Y represents an aliphatic group which has from 6 to 32 carbon atoms; a^1 and a^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbyl group which has from 1 to 8 carbon atoms, a —COO—Z^1 group or a —COO—Z^1 group which is linked via a hydrocarbyl group which has from 1 to 8 carbon atoms, where Z^1 represents a hydrocarbyl group which has from 1 to 22 carbon atoms, wherein the amount of the repeating unit represented by general formula (I) is from 30 wt % to 100 wt % based on the resin for dispersion stabilization purposes, wherein the dispersed resin particles as toner particles are present in an amount of from 0.5 to 50 parts per 1000 parts by weight of the carrier liquid, and wherein the amount of macromonomer (B) is from 0.1 to 10 wt % with respect to monomer (A).

4,983,487

IMAGE TRANSFER METHOD

Charles T. Gilreath, 217 N.W. 34th Dr., Gainesville, Fla. 32607

Continuation of Ser. No. 850,288, Apr. 10, 1986, abandoned. This application Sep. 18, 1989, Ser. No. 414,588

Int. Cl.[5] G03G *13/16*

U.S. Cl. 430—126 **7 Claims**

1. A method for transferring a discrete toner image, which has been fixed and applied in a fusion process to a smooth and non-absorbent image-releasing substrate and which exists in a stable form outside of the process by which it was formed, from said image-releasing substrate to a final substrate, said method comprising the following:

(a) selecting a target image to be transferred, said target image having one surface fused with but substantially and integrally detachable from the initial substrate and having an exposed surface not in contact with the initial substrate and accessible from one side of the initial substrate,

(b) contacting said exposed surface of the target image and areas of said initial substrate adjacent to said image with a pressure-sensitive adhesive coating carried on one side of a transparent film to cause adhesion of the target image to said film,

(c) separating the film from the initial substrate, while maintaining adhesion of target image to said film to thereby detach substantially all of the target image from said initial substrate,

(d) positioning the adhesive side of the film with the target image attached over the desired location on the final substrate,

(e) adhering the film to the final substrate to attach the target image thereto and encapsulate it,

(f) maintaining all of the materials substantially dry throughout the process, and

(g) maintaining all of the materials substantially at ambient temperature.

4,983,488

PROCESS FOR PRODUCING TONER FOR ELECTROPHOTOGRAPHY

Ryoji Tan; Shigeyoshi Tanaka; Ken-ichi Kishi; Yasuyuki Iguchi; Takeo Kudo; Takashi Amano, and Hideki Kohno, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 724,202, Apr. 17, 1985. This application Mar. 30, 1990, Ser. No. 501,733

Claims priority, application Japan, Apr. 17, 1984, 59-77064; Apr. 23, 1984, 59-81483; Jan. 21, 1985, 60-8917; Jan. 21, 1985, 60-8919; Feb. 21, 1985, 60-8918

Int. Cl.[5] G03G *9/087;* C08L *29/04, 27/12*

U.S. Cl. 430—137 **15 Claims**

1. A process for producing a toner for electrophotography which comprises polymerizing a polymerizable monomer dispersed by emulsification in the presence of a colorant and/or a magnetic powder to prepare a principal resin component, effecting the coagulation of the resulting polymerization liquid by adding a coagulating agent in such a way that the particles in the liquid after coagulation have diameters suitable as a toner, and then heating the resulting coagulated liquid at a temperature no lower than the glass transition point of the principal resin component after coagulation.

4,983,489

IMAGE-FORMING METHOD USING SILVER HALIDE AND POLYMERIZABLE COMPOUND WITH DEVELOPMENT INHIBITOR RELEASER

Makoto Yamada, and Tetsunori Matsushita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1989, Ser. No. 329,152

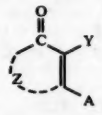
Claims priority, application Japan, Mar. 25, 1988, 63-71247

Int. Cl.[5] G03C *5/54;* G03F *7/26*

U.S. Cl. 430—138 **7 Claims**

1. An image-forming method which comprises the steps of:

imagewise exposing to light a light-sensitive material comprising a support and a light-sensitive layer provided thereon which contains a silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound, a base or base precursor and a development inhibitor precursor having the formula (I):



(I)

in which A is a development inhibitor bonded through a hetero atom or a group capable of releasing the development inhibitor by an elimination reaction and the subsequent reaction, Y is an optional atom or group, and Z is an atom group required for forming a carbon atom ring or a hetero ring, and

heat-developing the light-sensitive material at a temperature in the range of 90° to 200° C. after or simultaneously with the above imagewise exposure to release the development inhibitor from the precursor and to imagewise polymerize said polymerizable compound.

5. The image-forming method as claimed in claim 1, wherein

said silver halide, reducing agent and polymerizable compound are contained in microcapsules dispersed in the light-sensitive layer.

4,983,490

PHOTORESIST TREATING COMPOSITION CONSISTING OF A MIXTURE OF PROPYLENE GLYCOL ALKYL ETHER AND PROPYLENE GLYCOL ALKYL ETHER ACETATE

Dana Durham, Bloomsbury, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 97,257, Sep. 17, 1987, abandoned, which is a continuation of Ser. No. 791,979, Oct. 28, 1985, abandoned. This application May 15, 1989, Ser. No. 352,618

Int. Cl.[5] G03C *11/06*; G03F *7/42, 7/32, 7/16*

U.S. Cl. 430—169 **10 Claims**

1. A method of treating a photoresist composition disposed on a surface which photoresist composition comprises in admixture a resin selected from the group consisting of novolaks and polyvinyl phenols and at least one o-quinone diazide, which method comprises contacting said composition with a mixture, in an amount sufficient to produce a substantially uniform thickness of said photographic composition across said surface, wherein said mixture consists of from about 1 to about 10 parts by weight, based on the mixture, of at least one propylene glycol monoalkyl ether and from about 1 to about 10 parts by weight, based on the mixture, of at least one propylene glycol monoalkyl ether acetate.

6. A method for stripping a photoresist from a substrate, which photoresist comprises in admixture a resin selected from the group consisting of novolaks and polyvinyl phenols, and at least one o-quinone diazide, said method comprising contacting said photoresist with a stripping composition, in an amount sufficient to remove all or substantially all of said photoresist from said substrate, wherein said stripping composition consists of from about 1 to about 10 parts by weight, based on the stripping composition, of at least one propylene glycol monoalkyl ether and from about 1 to about 10 parts by weight, based on the stripping composition, of at least one propylene glycol monoalkyl ether acetate.

9. A method for thinning a liquid photoresist composition, which composition comprises an admixture a resin selected from the group consisting of novolaks and polyvinyl phenols, an o-quinone diazide and a solvent said method comprising mixing a thinner composition with said liquid photoresist composition in an amount sufficient to reduce the thickness of said liquid photoresist composition, wherein said thinner composition consists of from about 1 to about 10 parts by weight, based on the thinner composition, of at least one propylene glycol monoalkyl ether and from about 1 to about 10 parts by weight, based on the thinner composition, of at least one propylene glycol monoalkyl ether acetate.

4,983,491

PHOTOSENSITIVE DIAZO RESIN COMPOSITION WITH POLYURETHANE RESIN HAVING CARBOXYL GROUP IN ITS MAIN CHAIN

Toshiaki Aoai; Kazuo Maemoto, and Akihiko Kamiya, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd.

Continuation of Ser. No. 132,237, Dec. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 934,574, Nov. 24, 1986, abandoned. This application Sep. 22, 1989, Ser. No. 412,544

Claims priority, application Japan, Nov. 22, 1985, 60-263232; Nov. 22, 1985, 60-263233

Int. Cl.[5] G03F *7/021*; G03C *1/60*

U.S. Cl. 430—175 **8 Claims**

1. A photosensitive composition comprising one or more of a light-sensitive diazonium condensate resin in admixture with one or more of a polyurethane resin having a carboxyl group, wherein said diazonium condensate resin is contained in an amount of from 1 to 50 wt % based on a total composition, and said polyurethane resin is contained in an amount of from 50 to 99.5 wt % based on a total composition, and said polyurethane, having 0.90 to 3.07 meq/g of group content and is selected from the group consisting of the following polyurethane resins (A) and (B):

(A) Polyurethane resin which is prepared by a reaction of at least one diol having a carboxyl group with at least one diisocyanate compound, and

(B) Polyurethane resin which is prepared by an incorporation of a moiety containing a cyano group and/or a hydroxyl group to the polyurethane resin (A),

wherein said photosensitive composition, after coating on a support, imagewise exposure to light of the coating, and subsequent aqueous alkaline development of the coating, results in the formation of lithographic printing plate image.

4,983,492

POSITIVE DYE PHOTORESIST COMPOSITIONS WITH 2,4-BIS(PHENYLAZO)RESORCINOL

Peter Trefonas, III; Anthony Zampini, both of St. Louis, and David C. Madoux, Maryland Heights, all of Mo., assignors to Shipley Company Inc., Newton, Mass.

Filed Jun. 6, 1988, Ser. No. 203,043

Int. Cl.[5] G03F *7/022*; G03C *1/61*

U.S. Cl. 430—191 **18 Claims**

1. A positive working photoresist composition comprising an admixture of an aqueous alkaline soluble polymeric resin, an organic photoacid, each in an amount sufficient to form a composition that is photoactive and capable of development following irradiation at a wavelength of from 365 to 436 nm, and a sufficient amount of 2,4-bis (phenylazo)resorcinol dye to adsorb stray reflections from a reflective surface at exposure wavelengths during irradiation.

2. A positive working photoresist composition comprising an admixture of a solvent and solid ingredients dissolved therein, said solvent being present in an amount sufficient to form a liquid coating composition and said solids, based by weight of total solids in said composition comprising:

(a) from about 75 to about 92 percent of a mixture of a base soluble phenolic resin;

(b) a 2,4-bis(azophenyl)resorcinol dye that exhibits an adsorption maxima at a wavelength of about 436 nm, said dye being present in an amount of from about 0.4 percent to about 8 percent of the weight of resin, and

(c) from about 8 to about 25 percent of an o-naphthoquinone diazide ester of a polyhydroxy ballast group.

4,983,493

DYES FOR HEAT SENSITIVE TRANSFER RECORDING

Takeshi Nakamine; Michio Ono, and Seiiti Kubodera, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

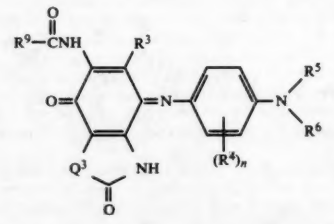
Filed Jul. 14, 1988, Ser. No. 218,789

Claims priority, application Japan, Jul. 15, 1987, 62-176625

Int. Cl.[5] G03C *8/00*; C07D *279/36, 471/00, 217/22*

U.S. Cl. 430—201 **3 Claims**

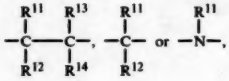
1. A dye for heat transfer recording represented by formula (III):



(III)

wherein R^3 represents a hydrogen atom, a halogen atom, an

alkoxy group, or an aliphatic group which has from 1 to 6 carbon atoms; R^4 represents a halogen atom, an alkoxy group, or an aliphatic group which has from 1 to 6 carbon atoms; n represents an integer of from 0 to 4; R^3 may be joined to R^9 or R^4 to form a ring; R^5 and R^6, which may be the same or different, each represents a hydrogen atom, an aliphatic group which has from 1 to 6 carbon atoms, or a phenyl, 2-pyridyl, 2-imidazoyl or 2-furyl group; R^5 and R^6 may be joined together to form a ring; and at least one of R^5 and R^6 may be joined with R^4 to form a ring, R^9 represents a branched or straight chained or cyclic aliphatic group, an aryl group or a heterocyclic group, and wherein Q^3 represents —C=C—,



wherein R^{11}, R^{12}, R^{13} and R^{14} each represents a hydrogen atom or a branched or straight chained or cyclic aliphatic group.

4,983,494

IMAGE FORMING PROCESS INCLUDING HEATING STEP

Hiroshi Kitaguchi, and Masatoshi Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

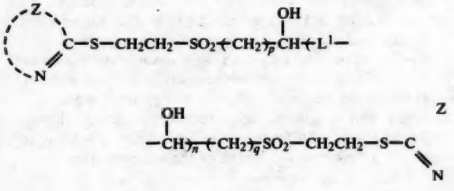
Continuation of Ser. No. 281,866, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 918,970, Oct. 15, 1986, abandoned. This application Oct. 18, 1989, Ser. No. 423,674

Claims priority, application Japan, Oct. 16, 1985, 60-230494; Oct. 16, 1985, 60-230495; Apr. 7, 1986, 61-79688; Apr. 14, 1986, 61-85761; Apr. 18, 1986, 61-89807

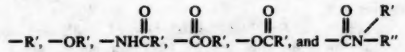
Int. Cl.[5] C03C *8/00*

U.S. Cl. 430—203 **5 Claims**

1. A process for forming an image comprising a step of heating a heat-developable photosensitive material containing a silver halide in the presence of a compound selected from the group consisting of compounds of general formula (I–II):



wherein Z represents a group of nonmetallic atoms necessary to complete a phenyltetrazole ring in which the phenyl radical has attached thereto a substituent selected from the group consisting of:



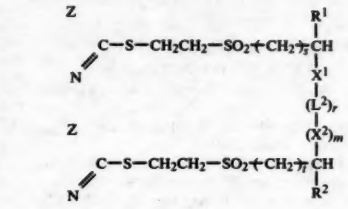
wherein R′ is a substituted or unsubstituted alkyl radical having 3 to 20 carbon atoms or a substituted or unsubstituted aryl radical, and R″ is a hydrogen atom or a radical as defined for R′,

L^1 is a valence bond or a substituted or unsubstituted divalent radical,

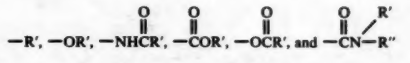
p and q each are an integer of 1 or 2, and

n is an integer of 0 or 1;

compounds of general formula (II—II):



wherein Z represents a group of nonmetallic atoms necessary to complete a phenyltetrazole ring in which the phenyl radical has attached thereto a substituent selected from the group consisting of:



wherein R′ is a substituted or unsubstituted alkyl radical having 3 to 20 carbon atoms or a substituted or unsubstituted aryl radical, and R″ is a hydrogen atom or a radical as defined for R′,

R^1 and R^2 may be the same or different and are individually selected from a hydrogen atom and an alkyl radical having 1 to 4 carbon atoms,

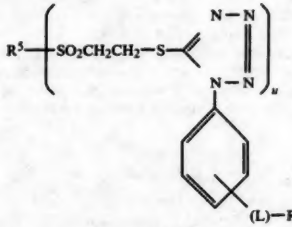
s and t each are an integer of 0 to 3 and may be the same or different,

X^1 and X^2 may be the same or different and individually selected from an ester linkage, a substituted or unsubstituted amide linkage, and an ether linkage,

L^2 is selected from an alkylene, phenylene, and xylylene radical,

when X^1 and X^2 are amide linkages, the substituents on the nitrogen may be bonded to form a heterocyclic ring together with parts of L^2, X^1, and X^2, and

m and r each are an integer of 0 or 1; and compounds of general formula (III–I):

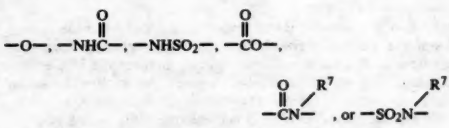


wherein u is an integer of 1 or 2,

R^5 represents a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, or phenyul radical when u is 1, and R^5 represents a substituted or unsubstituted phenylene or alkylene radical when u is 2,

R^6 represents a substituted or unsubstituted alkyl having at least 3 carbon atoms or a cycloalkyl radical, and

—(L)13 represents a valence bond or



wherein R^7 is selected from a hydrogen atom and the radicals defined for R^6 and may be the same as or different from R^6.

4,983,495

POSITIVE RESIST PATTERNS

Yoshitaka Tsutsumi, Shinnanyo; Toru Seita, Atsugi; Kousaburou Matsumura, Shinnanyo; Kyoko Nagaoka, Atsugi, and Toshimitsu Yanagihara, Shinnanyo, all of Japan, assignors to Tosoh Corporation, Yamag, Japan

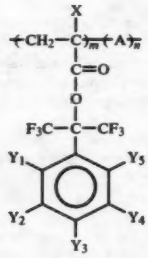
Continuation of Ser. No. 235,410, Aug. 22, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 456,624

Claims priority, application Japan, Aug. 20, 1987, 62-205155

Int. Cl.[5] G03F *7/039*

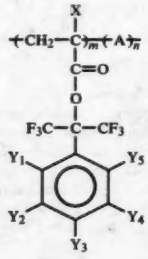
U.S. Cl. 430—270 **22 Claims**

1. A process for making positive resist patterns using a resist material comprising a derivative of polyacrylic acid esters containing halogen represented by the following general formula:



where A is a structural unit which is derived from monomers having a copolymerizable double bond selected from the group consisting of acrylic acid esters, methacrylic acid esters, substituted acrylic acid esters, unsaturated carboxylic acids, acid amides, vinyl esters, aromatic vinyl compounds, acrylonitrile and methacrylonitrile; X is a halogen atom; m is a positive integer, n is 0 or a positive integer, n/m is 0 to 2 and m+n are 20 to 20,000; Y_1 to Y_5 are a fluorine or hydrogen atom and at least one on Y_1 to Y_5 is a fluorine atom, comprising the steps of applying the resist material onto a substrate, irradiating the applied resist material, and developing the irradiated resist material to provide a positive resist pattern.

9. A positive resist for preparation of positive resist patterns by irradiation with electron beams, X-rays and deep ultraviolet rays, comprising a derivative of polyacrylic acid esters containing halogen represented by the following general formula:



where A is a structural unit which is derived from monomers having a copolymerizable double bond selected from the group consisting of acrylic acid esters, methacrylic acid esters, α-substituted acrylic acid esters, unsaturated carboxylic acids, acid amides, vinyl esters, aromatic vinyl compounds, acrylonitrile and methacrylonitrile; X is a halogen atom; m is a positive integer, n is 0 or a positive integer, n/m is 0 to 2 and m+n are 20 to 20,000; Y_1 to Y_5 are a fluorine or hydrogen atom and at least one of Y_1 to Y_5 is a fluorine atom.

4,983,496

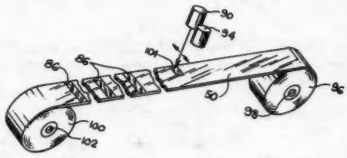
METHOD FOR WRITING POSITION-INDICATING MARKERS ON MAGNETIC TAPE

Chester W. Newell, San Jose, and Arthur D. Bates, Menlo Park, both of Calif., assignors to Newell Research Corporation, Campbell, Calif.

Division of Ser. No. 202,482, Jun. 2, 1988, Pat. No. 4,848,698. This application May 25, 1989, Ser. No. 356,998

Int. Cl.[5] G03C *1/494*; G01D *15/16*

U.S. Cl. 430—270 **13 Claims**



1. A method of marking position-indicating marks on a length of magnetic tape having a generally transparent tape substrate and having at least one light-absorptive coating made of magnetic material on a surface of said tape substrate, the method comprising the steps of,

(a) directing a first laser beam having a selected energy onto a length of magnetic tape, the magnetic tape having a magnetic, light-absorptive coating on a surface of a generally transparent tape substrate,

(b) providing continuous movement to said length of magnetic tape in a longitudinal direction by winding the length of magnetic tape from a supply roll to a take-up roll,

(c) scanning said continuously moving length of magnetic tape with said first laser beam in a raster like manner, and

(d) modulating said selected energy of said first laser beam, during said scanning, between a first energy level sufficient to ablate said magnetic, light-absorptive coating yet leave said tape substrate substantially intact, and a second energy level below a minimum energy level required to ablate said magnetic, light-absorptive coating, thereby forming generally transmissive rectangular marks at selected positions in the length of the magnetic tape.

4,983,497

TREATED ANODIZED ALUMINUM SUPPORT AND LITHOGRAPHIC PRINTING PLATE CONTAINING SAME

Richard E. Gilson, Rochester, N.Y., and Gary R. Miller, Fort Collins, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 786,403, Oct. 10, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 38,436

Int. Cl.[5] B41N *1/08*

U.S. Cl. 430—272 **7 Claims**

2. A lithographic printing plate comprising:

(a) a lithographic printing plate support material comprising an anodized aluminum plate having an anodic layer, a silicate layer in contact with the anodic layer, and a zinc acetate layer, in contact with the silicate layer, formed by treating the silicate layer with an aqueous bath consisting essentially of a solution of zinc acetate, and

(b) a radiation sensitive layer.

4,983,498

PHOTOPOLYMERIZABLE MIXTURE AND RECORDING MATERIAL PRODUCED THEREFROM

Klaus Rode, Wiesbaden; Dieter Mohr, Budenheim, and Werner Frass, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 23, 1988, Ser. No. 173,559

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710281

Int. Cl.[5] G03C 7/029

U.S. Cl. 430—284 19 Claims

1. A photopolymerizable mixture, consisting essentially of:
(a) a polymeric binder,
(b) an acrylate or alkacrylate or a polyhydric alcohol, comprising one or more groups which are photooxidizable on exposure in the presence of a photoreducible dye, and one or more urethane groups,
(c) a photoreducible dye as a photoinitiator component,
(d) a trihalomethyl compound which can be cleaved by irradiation, and
(e) an acridine, phenazine or quinoxaline compound which acts as a photoinitiator.

17. A photopolymerizable mixture comprising:
(a) a polymeric binder, present in an amount sufficient to produce a uniform film,
(b) an acrylate or alkacrylate of a polyhydric alcohol, comprising one or more groups which are photooxidizable on exposure in the presence of a photoreducible dye, and one or more urethane groups present in an amount sufficient to render exposed areas of said photopolymerizable mixture insoluble in developer solution,
(c) a photoreducible dye as a photoinitiator component,
(d) a trihalomethyl compound which can be cleaved by irradiation, and
(e) an acridine, phenazine or quinoxaline compound which acts as a photoinitiator, wherein components c, d and e are present in an amount sufficient to increase the sensitivity of the mixture.

4,983,499

METHOD OF FORMING WAVEGUIDE LENS HAVING REFRACTIVE INDEX DISTRIBUTION

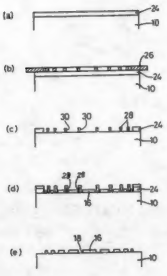
Makoto Suzuki, Nagoya; Shoji Yamada, Aichi; Kazunari Taki, Nagoya, and Akihiro Suzuki, Nishio, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 93,703, Sep. 8, 1987, abandoned. This application Jan. 25, 1990, Ser. No. 469,682

Claims priority, application Japan, Sep. 11, 1986, 61-214705

Int. Cl.[5] G03C 5/00; B05D 5/06; G02B 6/10

U.S. Cl. 430—321 7 Claims



1. A method of forming in a two-dimensional waveguide formed on a substrate a waveguide lens having a predetermined distribution of refractive index, for converging or diverging light rays which propagate through said two-dimensional waveguide, comprising the steps of:
forming a film of a diffusion metal having a constant thickness, in a region of a surface of said waveguide on the substrate in which said waveguide lens is to be formed;
forming an etching mask of a photo resist on said film of the diffusion metal, said mask having a multiplicity of separate openings and separate non-open portions defined by said separate openings, said separate openings being formed such that a ratio of an area of said openings to an area of said non-open portions per unit area of said mask is continuously varied in a direction which intersects a direction of propagation of said light rays through said waveguide, said separate openings corresponding to local portions of said film;
effecting an etching operation to remove said local portions of said film which are exposed through said multiplicity of separate openings, so that a density of the removed local portions of said film per unit area of said film is continuously varied in said direction; and
effecting thermal diffusion of a remainder of said film into said waveguide on said substrate, such that a density of diffusion of said diffusion metal in said region of said waveguide is continuously varied in said direction, to thereby form said waveguide lens such that the refractive index of the waveguide lens is continuously varied in said direction.

2. A method of forming in a two-dimensional waveguide formed on a substrate a waveguide lens having a predetermined distribution of refractive index, for converging or diverging light rays which propagate through said two-dimensional waveguide, comprising the steps of:
forming a mask in a region of a surface of said waveguide on the substrate in which said waveguide lens is to be formed, said mask being made of a photo resist and having a multiplicity of separate openings and separate non-open portions defined by said separate openings, said separate openings being formed such that a ratio of an area of said openings to an area of said non-open portions per unit area of said mask is continuously varied in a direction which intersects a direction of propagation of said light rays through said waveguide;
applying to a multiplicity of separate exposed areas of said region of the waveguide, which are aligned with said separate openings, a material which serves to change a refractive index of said waveguide, whereby a density of said material in said region is continuously varied in said direction; and
effecting thermal diffusion of said material into said waveguide on said substrate, such that a density of diffusion of said material in said region of said waveguide is continuously varied in said direction, to thereby form said waveguide lens such that the refractive index of the waveguide lens is continuously varied in said direction.

5. A method of forming in a two-dimensional waveguide formed on a substrate a waveguide lens having a predetermined distribution of refractive index, for converging or diverging light rays which propagate through said two-dimensional waveguide, comprising the steps of:
forming a mask in a region of a surface of said waveguide on the substrate in which said waveguide lens is to be formed, said mask being made of a photo resist and having a multiplicity of separate openings and separate non-open portions defined by said separate openings, said separate openings being formed such that a ratio of an area of said openings to an area of said non-open portions per unit area of said mask is continuously varied in a direction which intersects a direction of propagation of said light rays through said waveguide;
applying to a multiplicity of separate exposed areas of said region of the waveguide, which are aligned with said separate openings, a material which serves to change a refractive index of said waveguide, whereby a density of

said material in said region is continuously varied in said direction; and

moving ions of said material which serve to change the refractive index of the waveguide into an interior of the waveguide, and moving ions of said waveguide which are exchanged for said material toward said surface of the waveguide, such that a density of diffusion of said material into said interior of the waveguide is continuously varied in said direction, to thereby form said waveguide lens such that the refractive index of the waveguide lens is continuously varied in said direction.

4,983,500

RADIATION IMAGING PROCESS FOR FORMATION OF CONTRAST ENHANCED PATTERN USING TWO PHOTOSENSITIVE DIALONIUM SALT LAYERS WITH REMOVAL OF OVERLAYER AND DEVELOPED RESIST PATTERN IN UNDERLAYER

Shouichi Uchino, Hachioji; Takao Iwayanagi, Tokyo, and Michiaki Hashimoto, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 260,747

Claims priority, application Japan, Oct. 30, 1987, 62-273145

Int. Cl.[5] G03F *7/016, 7/021, 7/32*

U.S. Cl. 430—325 **18 Claims**

1. A process for forming a pattern on a substrate which comprises the steps of:

(a) forming a layer of first organic polymer comprising an alkali-soluble film of a phenolic resin on the substrate, said film having thickness of 0.3–2.0 μm;

(b) forming a first radiation sensitive film on said substrate by coating said phenolic resin film with a solution containing an aromatic diazonium compound comprising a photosensitive diazonium salt and a second organic polymer which is water-soluble and possesses high permeability to nitrogen gas generated due to photodecomposition of said diazonium salt upon exposure to radiation to dope said aromatic diazonium compound into said phenolic resin;

(c) forming a second photosensitive film by mixing the solution containing the water-soluble second organic polymer and the aromatic diazonium compound containing said photosensitive diazonium salt which remains on said first radiation sensitive film after doping the diazonium salt into said phenolic resin, said second photosensitve film having thickness of 0.2–1.0 μm;

(d) selectively irradiating predetermined areas of said first radiation sensitive film through said second photosensitive film to decrease in solubility in a developer for said first radiation sensitive film; and

(e) removing said second photosensitive film and then developing said first radiation sensitive film, or simultaneously removing said second photosensitive film and developing said first radiation sensitive film to remove portions of said first radiation sensitive film which have not been irradiated to form a resist pattern possessing high resolution and contrast caused by the second radiation sensitive film functioning as a contrast enhancement composition.

4,983,501

POSITIVE-WORKING RADIATION-SENSITIVE COMPOSITION AND RADIATION-SENSITIVE RECORDING MATERIAL PREPARED THEREWITH

Hans Ruckert, Wiesbaden-Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 3, 1989, Ser. No. 388,817

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827901

Int. Cl.[5] G03C *5/00*

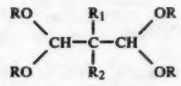
U.S. Cl. 430—326 **11 Claims**

1. A positive-working radiation-sensitive composition comprising:

(a) a binder which is insoluble in water and soluble or swellable in organic solvents and in aqueous-alkaline solutions,

(b) a compound which forms a strong acid upon irradiation, and

(c) an acetal compound of the general formula



wherein

R denotes an alkyl group which may be substituted, and

R_1 and R_2 are identical or different and denote alkyl groups containing 1 to 6 carbon atoms.

4,983,502

HEAT DEVELOPING PHOTOSENSITIVE MATERIAL

Keiji Ohbayashi; Tawara Komamura; Sohei Goto, and Hidenobu Ohya, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,895

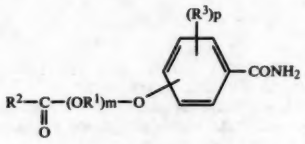
Claims priority, application Japan, Feb. 23, 1988, 63-39950; Aug. 17, 1988, 63-205228

Int. Cl.[5] G03C *5/54, 1/40*

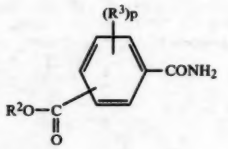
U.S. Cl. 430—353 **26 Claims**

1. A process of imagewise exposing a heat developing photosensitive material comprising silver halide, a binder, a reducing agent and a heat solvent, laying the material and an image receiving element one upon another during or after heat, and transferring the image formed onto an image receiving layer of the image receiving element under dry conditions, wherein said heat solvent is at least one selected from the group consisting of compounds represented by Formulae I, II and III;

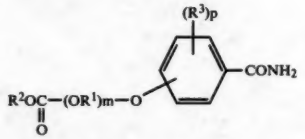
Formula I



Formula II



Formula III



wherein R^1 represents an alkylene group; R^2 represents an alkyl group, an alkenyl group or aryl group, each of which may either be substituted or unsubstituted; R^3 represents an alkyl group, an alkoxy group, an aryl group or an aryloxy group, each of which may either be substituted or unsubstituted, a halogen atom or a $—CONH_2$ group; p represents an integer of 0 to ∝and, when p is 2 or more, R^3 may be the identical or the different from each other; m represents 0, 1 or 2.

4,983,503

METHOD FOR PROCESSING LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRPAHIC MATERIAL

Masao Ishikawa; Shigeharu Koboshi; Satoru Kuse, and Masayuki Kurematsu, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

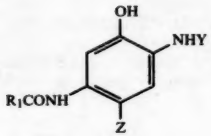
Continuation of Ser. No. 209,082, Jun. 17, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 488,473

Claims priority, application Japan, Jun. 24, 1987, 62-158439; Jun. 25, 1987, 62-159245; Jun. 26, 1987, 62-160449

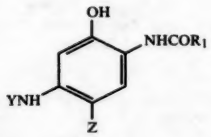
Int. Cl.[5] G03C 7/00, 7/02, 7/42

U.S. Cl. 430—393 15 Claims

1. A method for processing a light-sensitive silver halide color photographic material by subjecting a light-sensitive silver halide color photographic material after color developing to bleach-fixing processing, characterized in that said light-sensitive silver halide color photographic material contains at least one cyan coupler represented by the following formula (A), (B) or (C), or contains at least one magenta coupler represented by the following formula (M - 1), said bleach-fixing processing step is a step which is a counter-current system uses two or more tanks of continuous bleach-fixing tanks, and the silver concentration in the bleach-fixing solution in a final tank of said bleach-fixing tanks is maintained at 80% or lower of the silver concentration in a bleach-fixing solution in a first tank,

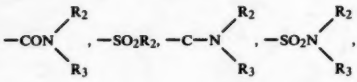


(A)



(B)

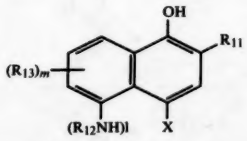
wherein R_1 represents an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group, Y represents a group represented by



$-CONHCOR_2$ or $-CONHSO_2R_2$

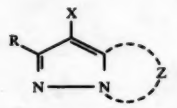
where R_2 represents an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group, and R_3 represents a hydrogen atom or a group represented by R_2, and R_2 and R_3 may be the same or different and may form a hetero ring of 5 to 6-membered by combining with each other;

Z represents a hydrogen atom or a group eliminatable through the coupling reaction with an oxidized product of an aromatic primary amine series color developing agent,



(C)

wherein R_{11} represents $-CONR_{14}R_{15}$, $-NHCOR_{14}$, $-NHCOOR_{16}$, $-NHSO2R_{16}$, $-NHCONR_{14}R_{15}$ or $-NHSO2NR_{14}R_{15}$; R_{12} represents a monovalent group; R_{13} represents a substituent group; X represents a hydrogen atom or a group eliminatable through the reaction with an oxidized product of an aromatic primary amine color developing agent; l is 0 or 1; and m is 0 to 3; where R_{14} and R_{15} each represent a hydrogen atom, an aromatic group, an aliphatic group or a heterocylic group; R_{16} represents an aromatic group, an aliphatic group or a heterocylic group; respectively, and when m is 2 or 3, each R_{13} may be the same or different and may form a ring to combine with each other, and also R_{14} and R_{15}, R_{12} and R_{13}, and R_{12} and X may form a ring to combine with each other, provided that l is 0, m is 0 and R_{11} is $-CONHR_{17}$ where R_{17} represents an aromatic group,



(M-1)

wherein Z represents a metal atom group necessary for forming a nitrogen-containing heterocyclic ring, and a ring formed by said Z may have a substituent or substituents; X represents a hydrogen atom or a group eliminatable through the reaction with an oxidized product of a color developing agent; and R represents a hydrogen atom or a substituent.

4,983,504

METHOD AND APPARATUS FOR PROCESSING PHOTOGRAPHIC COLOR MATERIALS

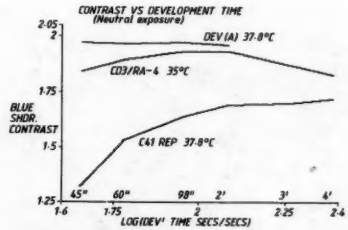
Peter D. Marsden, North Harrow; John R. Fyson, Hackney, and Peter J. Twist, Lee Common, all of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 21, 1989, Ser. No. 313,107

Claims priority, application United Kingdom, Feb. 26, 1988, 8804606

Int. Cl.[5] G03C 7/00, 7/30

U.S. Cl. 430—398 12 Claims



1. A method of processing photographic silver halide color negative film and color negative paper each through its own color developing solutions wherein the paper color developing solution is replenished and the overflow from this replenished solution is used to replenish the film color developing solution and wherein

(a) the color paper is based on substantially pure silver chloride emulsions and contains no more than 1% molar silver bromide based on total silver halide and

(b) both color developing solutions and the replenisher are free from benzyl alcohol.

4,983,505

OPTICAL RECORDING MEDIUM

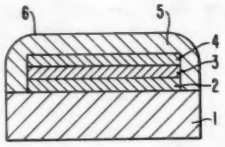
Manabu Higuchi, Kanagawa; Masao Yabe, Shizuoka; Hideki Matsubara, and Tetsuji Jitsumatsu, both of Aichi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Jul. 18, 1989, Ser. No. 381,424

Claims priority, application Japan, Jul. 19, 1988, 63-179761

Int. Cl.[5] G03C *1/00, 1/492;* B32B *15/08;* C08F *2/46*

U.S. Cl. 430—495 6 Claims



1. An optical recording medium comprising at least one recording layer on a substrate, further comprising a protective layer comprising a UV cured resin of a composition containing a urethane acrylate, N-vinyl-pyrrolidone, a trifunctional or greater functional acrylate, and a photoinitiator, wherein the urethane acrylate has at least two acryloyl groups in the molecule and a molecular weight of 400 to 1,500 per acryloyl group.

4,983,506

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shigetoshi Ono; Hirokazu Kondo, and Yoshisada Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1988, Ser. No. 257,665

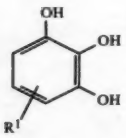
Claims priority, application Japan, Oct. 14, 1987, 62-258696; Feb. 5, 1988, 63-25483

Int. Cl.[5] G03C *7/26, 7/32, 1/06*

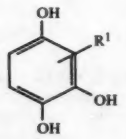
U.S. Cl. 430—531 6 Claims

1. A silver halide photographic material comprising at least one polymer obtained by the polycondensation of at least one compound selected from the group consisting of the formulae (III), (IV), (V), and (VI) and at least one compound represented by formula (II):

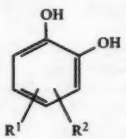
(II)



(III)

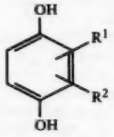


(IV)



(V)

-continued



(VI)

wherein R^1 and R^2 each represent a hydrogen atom or a substituent; and

R^3 and R^4 each represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, a heterocyclic group, an acyl group, a carboxyl group, or a formyl group, in the presence of an acid or alkali catalyst and wherein said polymer obtained by said polycondensation has a mean molecular weight of from 2,000 to 20,000 when said polymer does not contain a long chain alkyl moiety having 6 or more carbon atoms, and wherein said polymer obtained by said polycondensation product has a mean molecular weight of from 1,000 to 8,000 when said polymer contains a long chain alkyl moiety having 6 or more carbon atoms.

4,983,507

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Osamu Takahashi; Hideaki Naruse; Masakazu Morigaki; Nobutaka Ohki, and Nobuo Furutachi, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

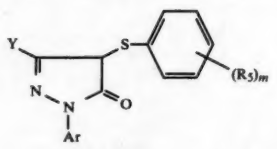
Division of Ser. No. 945,645, Dec. 23, 1986, abandoned. This application Oct. 26, 1988, Ser. No. 262,603

Claims priority, application Japan, Dec. 25, 1985, 60-295466; Feb. 5, 1986, 61-23467; Sep. 4, 1986, 61-208535

Int. Cl.[5] G03C *7/384, 7/392*

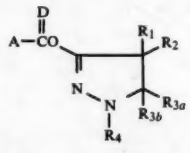
U.S. Cl. 430—551 15 Claims

1. A silver halide color photographic material comprising a layer containing at least one magenta color image-forming oleophilic coupler of formula (Ib) and at least one compound of formula (III):



(Ib)

in which Ar represents a phenyl group which is substituted by at least one substituent selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, an alkoxycarbonyl group and a cyano group; R_5 represents a hydrogen atom, a halogen atom, an acylamino group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, an alkylthio group, an alkoxycarbonyl group, a hydroxyl group, an alkyl group, an alkoxy group or an aryl group, which may optionally be substituted; m is an integer of 1 to 5 wherein when m is 2 or more, the R_5 groups may be the same or different; and Y represents an acylamino group or an anilino group; and



(III)

in which A represents an alkyl group, an aryl group, a heterocyclic group, an acyl group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, an alkylthio group, an arylthio group or an amino group, which may be substituted or unsubstituted; R_1 and R_2 each independently represent a hydrogen atom or a substituted or unsubstituted alkyl group; R_{3a} and R_{3b} each represent a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group or an arylthio group; R_4 represents an alkyl group, an aryl group or a heterocyclic group; and D represents an oxygen atom or a sulfur atom.

4,983,508

METHOD FOR MANUFACTURING A LIGHT-SENSITIVE SILVER HALIDE EMULSION

Shoji Ishiguro, and Kiyoshi Morimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1988, Ser. No. 271,987

Claims priority, application Japan, Nov. 18, 1987, 62-291487

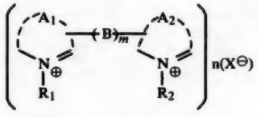
Int. Cl.[5] G03C 1/15, 1/35

U.S. Cl. 430—569 **18 Claims**

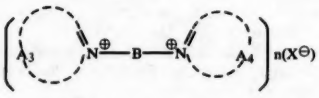
1. A method for producing a silver halide photographic emulsion comprising the step of:

reacting a water-soluble silver salt and at least one water-soluble halide salt containing chloride in aqueous solution in the presence of at least one compound represented by formulae (I) or (II):

(I)



(II)



wherein A_1, A_2, A_3 and A_4, which may be the same or different, each represents a nonmetallic atomic group necessary for forming a substituted or unsubstituted heterocyclic ring which may be condensed with a benzene ring, said heterocyclic ring being selected from the group consisting of pyridine, imidazole, thiazole, oxazole, pyrazine and pyrimidine; B represents a divalent linking group; R_1 and R_2, which may be the same or different, each represents an alkyl group; X represents an anion necessary for charge balance; m is 0 or 1; and n is 0, 1, 2 or 3;

to form light-sensitive silver halid grains having a silver chloride content of at least 50 mol %, selected from octahedral grains, tetradecahedral grains and tabular grains, wherein at least 30% of the surface area of said light-sensitive silver halide grains is composed of (111) planes.

4,983,509

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Nobuaki Inoue, and Tetsuo Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 15, 1989, Ser. No. 367,294

Claims priority, application Japan, Jun. 15, 1988, 63-147337; Jun. 15, 1988, 63-147338

Int. Cl.[5] G03C 1/04

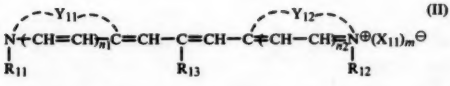
U.S. Cl. 430—627 **9 Claims**

1. A silver halide photographic material comprising a support having thereon at least one hydrophilic colloid layer, at least one layer of which must be a gold- and sulfur-sensitized silver halide emulsion layer, said silver halide emulsion layer containing from 0.1 to 3.0 mol % silver iodide per mol of silver, wherein said silver halide emulsion comprises silver halide grains having a substantial core/shell structure wherein the silver iodide content in the shell is less than that in the core, and the silver halide emulsion layer or other hydrophilic colloid layer contains a polymer represented by formula (I);

(I)

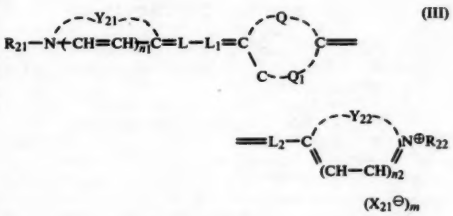
wherein A represents a recurring unit derived from an ethylenically unsaturated monocarboxylic acid or a monocarboxylate thereof, capable of copolymerization with an ethylenically unsaturated monomer; B represents a recurring unit derived from a polyfunction cross-linking agent; C represents a recurring unit derived from an ethylenically unsaturated monomer, other than A and B; x represents the number of recurring unit A having a mole fraction of from 30 mol % to 100 mol %; y represents the number of recurring units B having a mole fraction of from 0 to 50 mol %; and z represents the number of recurring units C having a mole fraction of from 0 to 50 mol %, said silver halide emulsion further containing at least one compound represented by formula (II) or (III):

(II)



wherein Y_{11} and Y_{12} each represents a non-metallic atomic group which completes a heterocyclic ring selected from a benzothiazole ring, a benzoselenazole ring, a napthothiazole ring, a napthoselenzaole ring, and a quinoline ring; R_{11} and R_{12} each represents a lower alkyl group or an alkyl group having a sulfo group or a carboxy group; R_{13} represents a lower alkyl group; X_{11} represents an anion; n_1 and n_2 each represents 0 or 1; and m represents 0 or 1, and when the compound represented by the formula (II) forms an intramolecular salt, m is 0:

(III)



wherein Y_{21} and Y_{22} each represents a non-metallic atomic group which completes a 5- or 6-membered nitrogen-containing heterocyclic nucleus; R_{21} and R_{22} each represents an alkyl group, a substituted alkyl group, or an aryl group; Q and Q_1 represent non-metallic atomic groups which together complete a 4-thiazolidinone nucleus, a 5-thiazolidinone nucleus, or a 4-imidazolidinone nucleus; L, L_1, and L_2 each represents a methine group or a substituted methine group; X_{21} represents an anion; and n_1, n_2, and m have the same meaning as defined for formula (II) above.

4,983,510

ENZYMES IMMOBILIZED ON LATEX POLYMER PARTICLES FOR USE WITH AN AMINO ACID ELECTROSENSOR

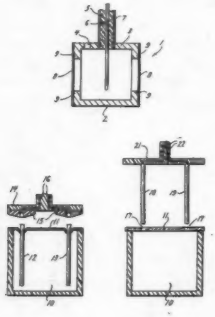
Pierre F. Lardinois; Paul G. Rouxhet; William E. E. Stone, all of Louvain-la-Neuve; Kenneth M. Baker, Brussels, and Alain E. Baudichau, Tourinnes-la-Grosse, all of Belgium, assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1988, Ser. No. 262,862

Claims priority, application United Kingdom, Oct. 29, 1987, 8725333

Int. Cl.[5] C12Q *1/00, 1/26;* C12N *11/08;* C12M *1/40*

U.S. Cl. 435—4 5 Claims



1. An electrosensor for use in assaying an amino acid selected from L-methionine, L-lysine, L-aspartic acid and L-tryptophan comprising a pH-sensitive electrode located in a sensing zone containing in aqueous dispersion a latex of polymer particles having an enzyme corresponding to the amino acid being assayed immobilized thereon by having been contacted with latex polymer particles having a surface charge such that electrophoretic mobility of the latex particles has a negative value of $-2.0\ 10^{-8}m^2V^{-1}sec^{-1}$ or below when measured at pH 7 in 0.01M KNO3 and a polymer solids concentration of 30 mg/l, and having a hydrophobic surface such that the contact angle of a 1 microliter droplet of distilled water with a plane horizontal surface formed by drying and compacting the latex particles is 70° or more.

4,983,511

METHOD AND KIT FOR DETECTING LIVE MICROORGANISMS IN CHLORINE-OR BROMINE-TREATED WATER

Jon R. Geiger, West Hartford; Jayne F. Carney, Wolcott, and Katherine P. Roberts, Derby, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jan. 9, 1989, Ser. No. 294,842

Int. Cl.[5] C12Q *1/68, 1/02, 1/04;* G01N *21/76*

U.S. Cl. 435—6 10 Claims

1. A method for detecting the presence of live microorganisms in a mixture of live and dead microorganisms in chlorine- or bromine-treated water comprising:

(a) lysing live microorganisms present in a sample of chlorine- or bromine-treated water and rendering constituent nucleic acid molecules single-stranded to provide a single-stranded target polynucleotide;

(b) contacting said single-stranded target polynucleotide, under hybridization conditions, with first and second probe labels which are complementary to mutually exclusive portions of said single-stranded polynucleotide to cause hybridizaton between said single-stranded target polynucleotide and said first and second single-stranded labelled probe nucleic acid segments, said first and second single-stranded labelled probe nucleic acid segments co-operating after said hybridization to generate a detection signal, and

(c) detecting said detection signal to permit identification of said hybridization, whereby a positive detection signal evidences the presence of said live microorganisms in said sample.

4,983,512

REAGENT FOR DETERMINATION OF ACID PHOSPHATASE

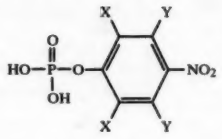
Shinichi Teshima, Tsuruga, and Yuzo Hayashi, Kobe, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 14, 1987, Ser. No. 38,249

Int. Cl.[5] C12Q *1/42*

U.S. Cl. 435—21 2 Claims

1. A method for detecting acid phosphates in body fluids, which comprises reacting a body fluid with a reagent having a substrate compound of the formula:



wherein X is a halogen atom, Y is a hydrogen atom or halogen atom, and measuring the absorbance of the released phenol compound by colorimetry.

4,983,513

SULFHYDRYL COMPOUNDS FOR SUPPRESSING THE INHIBITORY EFFECTS OF NAD DEGRADATION PRODUCTS ON LD-L ACTIVITY

Tsung-I Lin, Yorba Linda, and Alice C. Liu, Westminster, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 28, 1986, Ser. No. 845,883

Int. Cl.[5] C12Q *1/32*

U.S. Cl. 435—26 57 Claims

1. A liquid NAD coenzyme reagent with an extended shelf life, the reagent for use for the quantitative determination of lactate dehydrogenase or lactate in a LP-L assay, the reagent comprising NAD coenzyme, and a sulfhydryl compound capable of counteracting the inhibitory effects of the degradation products of NAP coenzyme on LP-L activity, the reagent having a pH of less than about 3½, and the sulfhydryl compound being in a sufficient amount that when the reagent is stored in the substantial absence of oxygen at a temperature in the range of from about 2° to about 8° C., the reagent for a period of at least about 2 years maintains a LD-L activity of at least about 90% of that of the reagent when the NAD coenzyme was first put in solution in the reagent.

4,983,514

METHOD FOR DETECTING THE ANTIAGGREGATORY EFFECT OF VASOACTIVE SUBSTANCES, SPECIFICALLY OF INHIBITORS OF PHOSPHODIESTERASE AND/OR CYCLOOXYGENASE

Klaus U. Weithmann, Hofheim am Taunus, and Dirk Seiffge, Münzenberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,600

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717337

Int. Cl.[5] C12Q *1/02, 1/56*

U.S. Cl. 435—29 10 Claims

1. A method for detaching the antiaggregatory effect of

photophodiesterase inhibitors (A), cyclooxygenase inhibitors (B), or a mixture of inhibitors (A) and (B), outside the human or animal body in the presence of prostaglandin (C) comprising the steps of:

i. obtaining a blood sample,

ii. adding phosphodiesterase inhibitor (A), cyclooxygenase inhibitor (B), or a mixture of inhibitors (A) and (B), when they are not already present in said blood sample in either the unchanged or the metabolized form as consequence of having been administered to the subject human or animal body prior to said blood sampling, and

iii. adding at least one prostaglandin (C) before or no later than the start of the initiation of the platelet aggregation, and

iv. initiating and measuring the platelet aggregation.

4,983,515

LABELED CRYOPRESERVED CELLS FOR USE AS TARGETS IN CYTOTOXICITY ASSAYS

Derrick T. Maley, Hadden Township, N.J., and Agneta K. Nordstrom, Rutledge, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1989, Ser. No. 311,513

Int. Cl.[5] C12Q *1/02*; C12N *5/00*

U.S. Cl. 435—29 **13 Claims**

1. Cryopreserved, fluorophore-labeled, viable biological cells which after thawing are suitable for use as target cells in cytotoxicity assays.

2. Cryopreserved, europium-labeled, viable biological cells which after thawing are suitable for use as target cells in cytotoxicity assays.

4,983,516

BIOELECTROCHEMICAL MEASUREMENT OF MICROBIAL ACTIVITY USING A WORKING ELECTRODE OF CARBON-BEARING POROUS MATERIAL

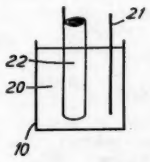
Anthony P. F. Turner, Cranfield; Alan P. Hodges, Pershore; Ann Franklin, Cranfield; Graham Ramsay, Cranfield, and Davina Steel, Cranfield, all of England, assignors to Paul De La Pena Limited, Worcestershire, England

Filed Sep. 23, 1986, Ser. No. 910,453

Claims priority, application United Kingdom, Sep. 25, 1985, 8523631

Int. Cl.[5] C12Q *1/04*; C12M *1/42*

U.S. Cl. 435—34 **7 Claims**



1. A method of measuring microbial activity in an aqueous medium by means of a bioelectrochemical cell, wherein the cell has a working electrode comprising electrically conductive carbon-bearing porous material, said material being such as to permit filtration and retention of bacteria from an aqueous suspension thereof bacteria to be filtered through it, said method comprising contacting the working electrode with an aqueous medium whose microbial activity is to be measured and measuring an electrical response from the bioelectrochemical cell, the response being related to the microbial activity of said sample.

4,983,517

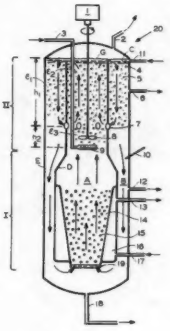
REACTING MATERIALS

Byung C. Kim, Columbus, Ohio, and Dewey D. Y. Ryu, Davis, Calif., assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 22, 1986, Ser. No. 899,177

Int. Cl.[5] C12P *1/00*

U.S. Cl. 435—41 **29 Claims**



1. A method for reacting materials to provide a product, comprising

furnishing a reactor having an inner column and an adjacent coaxial outer column, the reactor having throughout both columns an upper zone with an upper end and a lower end, and a lower zone with an upper end and a lower end; the lower end of the upper zone being adjacent to the upper end of the lower zone and communicating therewith in both columns;

filling both zones in the reactor with a liquid;

feeding a gas into the liquid at the lower end of the upper zone;

circulating the liquid and a part of the gas generally upward in one column and generally downward in the other column in the upper zone;

providing particles of a solid substance in a column in the lower zone; and

circulating the liquid between the lower zone and the upper zone in such manner that the liquid contacts and fluidizes the solid particles while confining them to the lower zone, while the gas contacts the liquid and is confined to the upper zone, thereby enabling the liquid to react with the solid particles and with the gas.

4,983,518

EUKARYOTIC EXPRESSION VECTORS WITH MULTIMERIC ENHANCER SEGMENTS, A PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF

Walter Schaffner, Weiningen, Switzerland, and Nils G. Westin, Upsala, Sweden, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,091

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723075

Int. Cl.[5] C12N *15/67, 15/85*

U.S. Cl. 435—69.1 **9 Claims**

1. A eukaryotic expression vector comprising:

(i) a gene to be expressed,

(ii) a TATA box,

(iii) from 3–30 copies of a first nucleotide sequence, wherein said nucleotide sequence in turn comprises from 1–7 copies of a non-viral enhancer sequence motif and is posi-

tioned from 1 to 200 base pairs upstream (5') of said TATA box, and

(iv) from 3 to 30 copies of a second nucleotide sequence, wherein said nucleotide sequence in turn comprises from 1–7 copies of a non-viral enhancer sequence motif of a human gene and is positioned from 1 to 1000 base pairs downstream (3') of said gene.

4,983,519

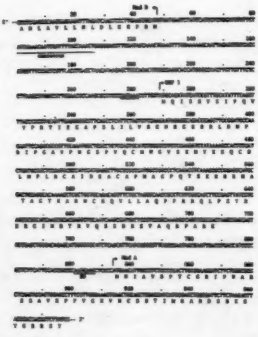
RECOMBINANT DNA CLONES OF ESSENTIAL NODULATION GENES OF *BRADYRHIZOBIUM JAPONICUM*

Gary Stacey, 2304 Sutters Mill La.; Maria G. Schell, 1903 Sutters Mill La., both of Knoxville, Tenn. 37923; Anthony J. Nieuwkoop, 390 Mayfair St., Holland, Mich. 49424; Nirupama A. Deshmane, 1611 Laurel Ave., Knoxville, Tenn. 37916, and Zsofia Banfalvi, H-6723, Szeged, Vajda u. 18/B, Hungary

Filed Jul. 24, 1987, Ser. No. 77,561

Int. Cl.[5] **C12N** *15/00, 1/00;* **C12R** *1/41;* **C07H** *15/12*

U.S. Cl. 435—172.3 **3 Claims**



1. An oligodeoxyribonucleotide consisting essentially of the sequence:

5'-ATGCAGATATCATCCGTTTCCATATTT-
CAGGTTTACCCGCGTAC AATT-
GAGGGCGCGTTCAGCCTCATTCTAGTGT-
CGAAGAATAG AGGCAGACGCAGGTTGC-
GGATGCCAAGAATTCCAGGCGCCGTTC
CAAATGGCTCGCCTGTCCAGT-
GCATGTGGGGCGTGTCGAAGA TGTA-
TAAAAGCCAGTGTGATCTGATGCCGCTC-
CGATGCGCCATC GATGAGGCTTGCGCGC-
CGATGGCCGGCCCTCAGACGTCAAAGCGC
CGGAGGCATGCGACTGCAGG-
CACAAAAGCTCGCTGGTGCAGACA
GGTTCTGCTAGCCCAACCGCCTCGTCG-
GCAGCTTCCGACTTATCG TGAGCGCGGCAT-
CAACCGCACGAGGGTGCAATCAAGC-
GATCGCT CCGTCGCGCAAAGGCCAGCGCG-
CGAGTAG-3'

wherein A represents adenine, T represents thymine, C represents cytosine, and G represents guanine, and a complement thereof, having activity as a nodL gene sequence in *Bradyrhizobium japonicum.*

4,983,520

DNA SEQUENCE ENCODING MODIFIED HEPATITIS B VIRUS SURFACE ANTIGEN P31 PROTEIN

Fujisawa Yukio, Kobe; Itoh Yasuaki, Nishinomiya; Nishimura Osamu, Kawanishi, and Fujii Tomoko, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 20, 1986, Ser. No. 898,425

Claims priority, application Japan, Aug. 20, 1985, 60-183344; Jan. 10, 1986, 61-4090; Jan. 10, 1986, 61-4091; Jun. 2, 1986, 61-128918

Int. Cl.[5] **C12N** *1/13, 1/19, 7/00, 15/11, 15/34, 15/81;* **A61K** *39/00*

U.S. Cl. 435—69.3 **51 Claims**

29. A method of producing (i) a hepatitis B virus surface antigen P25 protein, and (ii) a modified hepatitis B virus surface antigen P31 protein having hepatitis B virus surface antigenicity and the ability to find polymerized human serum albumin, wherein:

(a) the 48th amino acid residue Arg from the N-terminus of a hepatitis B virus surface antigen P31 protein or a peptide containing the 48th amino acid residue Arg within the range of the peptide chain covering the 44th to 49th amino acid residues from the N-terminus of a hepatitis B virus surface antigen P31 protein is eliminated or replaced by from one to four amino acids selected from the group consisting of asparagine, aspartic acid, alanine, isoleucine, glycine, glutamine, glutamic acid, cysteine, serine, tyrosine, tryptophan, threonine, valine, histidine, phenylalanine, proline, methionine and leucine, or

(b) the 48th amino acid residue Arg from the N-terminus of a hepatitis B virus surface antigen P31 protein or a peptide containing the 48th amino acid residue Arg within the range of the peptide chain covering the 44th to 49th amino acid residues from the N-terminus of a hepatitis B virus surface antigen P31 protein is eliminated or replaced by from one to four amino acids selected from the group consisting of asparagine, aspartic acid, alanine, isoleucine, glycine, glutamine, glutamic acid, cysteine, serine, tyrosine, tryptophan, threonine, valine, histidine, phenylalanine, proline, methionine and leucine, and at least one amino acid residue selected form the group consisting of the 16th, 18th, 177th and 196th amino acid residues from the N-terminus of a hepatitis B virus surface antigen P31 protein is replaced by an amino acid residue selected from asparagine, aspartic acid, alanine, isoleucine, glycine, glutamine, glutamic acid, cysteine, serine, tyrosine, tryptophan, threonine, valine, histidine, phenylalanine, proline, methionine and leucine,

the method comprising the steps of culturing a transformant carrying a DNA which contains a DNA sequence coding for the modified P31 protein and a DNA sequence coding for the P25 protein and recovering the modified P31 protein and the P25 protein produced thereby.

4,983,521

TRANSMEMBRANE INTEGRATOR SEQUENCES

Vishwanath R. Lingappa, San Francisco, Calif., and Charles S. Yost, Pittsburgh, Pa., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 545,727, Oct. 26, 1983, abandoned. This application Sep. 12, 1986, Ser. No. 906,809

Int. Cl.[5] **C12P** *21/00;* **C12N** *15/00*

U.S. Cl. 435—172.3 **19 Claims**

1. A method for modifying a plasma or microsomal membrane by genetically programming the binding of a polypeptide non-covalently to a cellular lipid membrane capable of translocating a nascent poly(amino acid) comprising at least one open reading frame joined to a transmembrane integrator sequence (tmi), said method comprising:

combining (1) a DNA sequence comprising in reading frame a tmi from a surface immunoglobulin and flanked on both sides by open reading frames encoding polypeptides in

reading frame with said tmi, wherein said open reading frames are not naturally joined to said tmi, and flanking DNA sequences comprising transcriptional and translational initiation and termination regulatory signals; (2) cellular membrane; and (3) translational components, to provide an expression system; and

incubating said expression system, whereby said DNA sequence is translated to said poly(amino acid) and said poly(amino acid) is translocated to said membrane and becomes bound to said membrane.

4,983,522

METHOD FOR PRODUCING THE HINPI RESTRICTION ENDONUCLEASE AND METHYLASE

Janet M. Barsomian, Georgetown, and Geoffrey G. Wilson, Boxford, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Dec. 17, 1987, Ser. No. 134,235
Int. Cl.[5] C12N *15/52, 9/22, 1/21*
U.S. Cl. 435—172.3 **10 Claims**

1. Isolated DNA coding for the HinPI restriction endonuclease, wherein the isolated DNA is obtainable from the vector pJB124RM4-11.

4,983,523

METHODS FOR PREPARING SAMPLE NUCLEIC ACIDS FOR HYBRIDIZATION

May K. Li, Framingham; Donna McLaughlin, Hudson; Elaine Palome, Rowley, and Jack Kessler, Ashland, all of Mass., assignors to Gene-Trak Systems, Framingham, Mass.

Filed Apr. 8, 1988, Ser. No. 179,349
Int. Cl.[5] C12N *13/00, 1/06;* C12P *19/30*
U.S. Cl. 435—173 **4 Claims**

1. A method for treating an aqueous sample containing microorganisms for releasing sample nucleic acids contained within the microorganisms for hybridization comprising the steps of:

(a) providing a non-invasive sonicator having a vibrating element tuned to resonate at a frequency of at least of 40 KHz but less than 100 KHz;

(b) further providing a container for receiving said aqueous sample, said container having at least one mating surface adapted for engaging with said vibrating element;

(c) adding said aqueous sample to said container;

(d) bringing said mating surface of said container into contact with said vibrating element of said sonicator while avoiding immersion of said vibrating element in said aqueous sample;

(e) energizing said sonicator to cause said vibrating element to vibrate for a time period of at least about 10 seconds.

4,983,524

METHOD OF IMMOBILIZING ENZYMES ON A SUPPORT WITH IRIDOID AGLYCONE CROSS-LINKING AGENTS

Shigeaki Fujikawa; Kunimasa Koga, and Tomoko Yokota, all of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Filed Dec. 21, 1987, Ser. No. 135,354
Claims priority, application Japan, Dec. 19, 1986, 61-302966
Int. Cl.[5] C12N *11/00, 11/10, 11/08, 11/06*
U.S. Cl. 435—174 **10 Claims**

1. A method for immobilizing an enzyme on a support comprising the steps of:

(a) contacting an enzyme with a support in a solution containing an iridoid aglycone cross-linking agent to immobilize the enzyme on the support; and

(b) collecting the immobilized enzyme resulting from step (a).

4,983,525

PLASMIDS DERIVED FROM ACTINOMADURA SPECIES

Jerald S. Feitelson, Englewood, and William M. Maiese, Montclair, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 2, 1987, Ser. No. 69,427
Int. Cl.[5] C12N *15/63*
U.S. Cl. 435—320 **7 Claims**

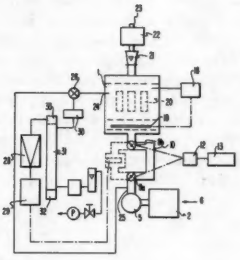
1. An isolated essentially pure plasmid derived from Actinomadura having at least one restriction cleavage site for specific restriction enzymes and a molecular size of less than 40,000 base pairs of DNA, wherein said plasmids are selected from the group consisting of pAkijl and pAverl.

4,983,526

METHOD OF MEASURING AND CONTROLLING OZONE CONCENTRATION

Shigeru Suga, Tokyo, and Kenhachi Mitsuhashi, Kanagawa, both of Japan, assignors to Suga Test Instruments Co., Ltd. and Yokohama Rubber Co., Ltd., both of Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 314,926
Claims priority, application Japan, Feb. 26, 1988, 63-45164
Int. Cl.[5] G01N *17/00, 21/00*
U.S. Cl. 436—55 **2 Claims**



1. A method of measuring or controlling a concentration of ozone by ultraviolet ray absorptiometry, said method comprising:

charging air into a testing tank and controlling the temperature of the air charged into the tank;

measuring any disturbing gases generated from testpieces such as rubber samples inside the testing tank by regarding any disturbing gases as ozone;

subtracting a value representative of the quantity of any disturbing gases regarded as ozone, by using a calculation circuit, from a value representative of a preexisting state in the testing tank to obtain a value representative of the ozone concentration in the testing tank being zero;

generating a necessary quantity of ozone in the tank with an ozonizer by using the value representative of the ozone concentration being zero as a reference point;

suspending the generation of ozone after the passage of a predetermined time;

obtaining a new said value representative of the ozone concentration being zero;

adjusting the value representative of the ozone concentration being zero, which is used in the step of generating, to said new value if there has been a change in the amount of disturbing gases generated since the step of measuring was carried out; and

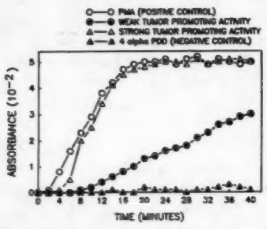
repeating at least once the above steps to regulate the ozone concentration to a desired ozone concentration.

4,983,527

OOCYTE TEST FOR DETECTION OF TUMOR PROMOTING COMPOUNDS

David G. Capco, and William M. Bement, both of Tempe, Ariz., assignors to Arizona Board of Regents, Tempe, Ariz.

Filed May 26, 1989, Ser. No. 357,704
Int. Cl.[5] C12N *1/00*; C12P *1/00*; G01N *33/483*
U.S. Cl. 436—63 14 Claims



1. A test for detecting the presence of tumor promoting activity in an unknown substance disposed in a preselected medium, said test comprising the steps of: admixing said unknown substance with a preselected medium to create a medium mixture; depositing said medium mixture on a Petri dish; depositing a controlled number of pretreated amphibian oocytes into said medium mixture on said Petri dish to form an Oocyte-containing medium mixture; incubating said Oocyty-containing medium mixture; measuring the surface contraction of the areas of the animal hemisphere of said oocytes occupied by a dark-colored pigment after said incubation; and comparing said contraction of said dark-colored pigment areas to that obtained by incubating an Oocyte without contact with said unknown substance to determine the percentage of said contraction of said dark-colored pigment area wherein an increase in pigment and an imbalance between the hemispheres is an indication of the presence of a tumor promoting activity.

4,983,528

MEASUREMENT OF UNSATURATION LEVEL IN BUTYL AND EPDM RUBBERS

Dennis A. Loucks, Bright's Grove, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Jun. 6, 1989, Ser. No. 362,335
Int. Cl.[5] G01N *21/00*
U.S. Cl. 436—141 12 Claims

1. A method for determining the amount of unsaturation in an unsaturated elastomeric interpolymer of at least one monoolefin and one diolefin selected from the group consisting of butyl rubbers and ethylene-propylene-nonconjugated diolefin rubbers, said method comprising:

(i) dissolving a known weight of said unsaturated elastomeric interpolymer in a measured volume of a suitable solvent capable of dissolving said unsaturated elastomeric interpolymer and transparent to ultraviolet radiation down to about 217 nanometers;

(ii) passing a sample of the resulting solution through a gel permeation chromatograph in which three or more chromatographic columns comprise columns of porous particles of cross-linked polymeric material having a diameter of about 4 microns to about 11 microns and a pore size in the range of 10^2 angstrom to 10^6 angstrom,

(iii) detecting the amount of unsaturation in said unsaturated elastomeric interpolymer as it is eluted from, the chromatographic column using an ultraviolet detector operated at a wavelength of about 217 nanometres to about 222 nanometres, and

(iv) quantifying the amount of unsaturation.

4,983,529

IMMUNOASSAY FOR HIV-I ANTIGENS USING F(AB')$_2$ FRAGMENTS AS PROBE

James L. Stewart, Buffalo Grove; Susan K. Ketchum, Libertyville, and Robert J. Stumpf, Chicago, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 10, 1988, Ser. No. 204,799
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] G01N *33/563*; C12Q *1/70, 1/00*
U.S. Cl. 436—512 14 Claims

1. An immunoassay for the detection of HIV 1 antigens in a biological sample comprising forming an antibody/antigen complex wherein the antibody portion of said complex comprises anti-HIV 1 F(ab')$_2$ fragments, and detecting the presence or amount of the antibody/antigen complex formed.

4,983,530

SANDWICH IMMUNOASSAY FOR DETERMINATION OF TOTAL MONOCLONAL IGG

Charles W. Carlson, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1988, Ser. No. 150,292
Int. Cl.[5] G01N *33/543, 33/577*
U.S. Cl. 436—518 5 Claims

1. A sandwich immunoassay for the determination of total monoclonal IgG content comprising the steps of:

(a) forming a first reaction mixture by contacting a sample containing monoclonal IgG with a support bearing

(i) both anti-kappa and anti-lambda-light-chain IgG capture antibodies specific for said monoclonal IgG or

(ii) an IgG capture antibody specific for the predominant IgG light chain type in the animal species from which the monoclonal IgG originated, provided that said IgG light chain type comprises at least 95% of the total IgG in said animal species;

(b) separating a bound first complex of capture antibody and monoclonal IgG formed in step (a) from unbound monoclonal IgG:

(c) forming a second reaction mixture by contacting said first complex with at least one labeled anti-light-chain IgG antibody having the same specificity for IgG light chain type as the capture antibody;

(d) separating the bound second complex of labeled antibody and said first complex so formed from the unbound labeled antibody;

(e) determining the amount of label in the second complex; and

(f) calculating the total monoclonal IgG content from a standard curve prepared by using a calibrator.

4,983,531

METHOD OF FABRICATING A SINGLE POLYSILICON BIPOLAR TRANSISTOR WHICH IS COMPATIBLE WITH A METHOD OF FABRICATING CMOS TRANSISTORS

Stephen J. Cosentino, Gilbert, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 12, 1990, Ser. No. 478,390
Int. Cl.[5] H01L *21/331*
U.S. Cl. 437—31 5 Claims

1. A method of fabricating a bipolar transistor that is compatible with a BiCMOS process, comprising the steps of:

providing a semiconductor substrate having a buried layer which serves as a collector;

forming a silicon dioxide layer on the substrate;

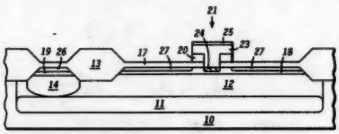
forming a nitride layer on the silicon dioxide layer;

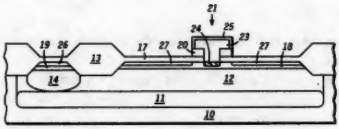
forming an active base region in the substrate;

etching an emitter opening in the nitride layer;

etching the silicon dioxide layer exposed by the emitter opening;

forming a polysilicon layer on the nitride layer and in the emitter opening;
doping the polysilicon layer;
annealing the substrate to form an emitter region in the active base region below the portion of the polysilicon layer which is in the emitter opening;
forming a silicide layer on the polysilicon layer;





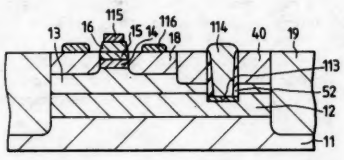
etching the silicide layer, the polysilicon layer, and the nitride layer to leave a portion of the silicide layer, the polysilicon layer, and the nitride layer surrounding the emitter opening; and
forming an extrinsic base region in the active base region, wherein the extrinsic base region is defined by the polysilicon layer and the nitride layer.

4,983,532

PROCESS FOR FABRICATING HETEROJUNCTION BIPOLAR TRANSISTORS

Katsuhiko Mitani, Kokubunji; Tomonori Tanoue, Ebina; Chushirou Kusano, Tokorozawa; Susumu Takahashi, Tokyo; Masayoshi Saito, Kokubunji; Hiroshi Miyazaki, Fuchu, and Fumio Murai, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,710
Claims priority, application Japan, Dec. 23, 1987, 62-324108
Int. Cl.[5] H01L *21/265, 21/331, 21/441*
U.S. Cl. 437—31 **14 Claims**



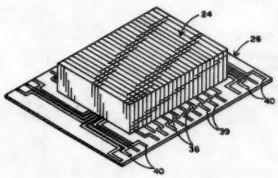
1. A process for fabricating a heterojunction bipolar transistor comprising:
a step of successively growing semiconductor layers serving as a subcollector, a collector, a base, and an emitter, respectively, through epitaxial growth on a compound semiconductor substrate in such a manner that at least one of the emitter junction and collector junction is a heterojunction, wherein said subcollector layer is a heavily doped InGaAs layer;
a step of establishing base contact through ion implantation;
a step of forming a dielectric material in a collector electrode drawing-out region;
a step of forming a dielectric layer on the surface of said epitaxial surface; and
a step of etching part of said dielectric layer and said dielectric material formed in said collector electrode drawing-out region to form a hole reaching the surface of said subcollector and burying a metal serving as a collector electrode in said hole according to the selective CVD method.

4,983,533

HIGH-DENSITY ELECTRONIC MODULES - PROCESS & PRODUCT

Tiong C. Go, El Toro, Calif., assignor to Irvine Sensors Corporation, Costa Mesa, Calif.

Filed Oct. 28, 1987, Ser. No. 114,415
Int. Cl.[5] H05K *7/00*
U.S. Cl. 437—7 **11 Claims**



1. A method for fabricating a package containing high density electronic circuitry, comprising:
providing a plurality of integrated circuit chips, each having a multiplicity of closely-spaced electrical leads at one or more edges thereof;
interspersing in the stack of integrated circuit chips a plurality of interleaved layers formed of material having high thermal conductivity to extract heat from the stack.
stacking and bonding the integrated circuit chips and the interleaved layers in a structure having an access plane, on which plane there is a two-dimensional array of closely-spaced electrical leads;
forming on the access plane, in direct or indirect electrical contact with the chip leads, a plurality of conductive lines and a plurality of conductive terminals;
providing a stack-carrying substrate adapted to support the stacked chips and having formed thereon a plurality of conductive lines and a plurality of conductive terminals;
the conductive terminals on the access plane being located in precise matched relationship with the conductive terminals on the stack-carrying substrate; and
securing the stacked structure to the stack-carrying substrate, with the conductive terminals on the access plane separately contacting the conductive terminals on the substrate.

4,983,534

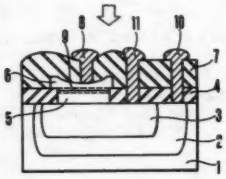
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Kuniko Kikuta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 293,417, Jan. 4, 1989, abandoned.
This application Jul. 20, 1990, Ser. No. 555,678
Claims priority, application Japan, Jan. 5, 1988, 63-946; Jan. 13, 1988, 63-3850
Int. Cl.[5] H01L *21/331*
U.S. Cl. 437—31 **16 Claims**

1. A method of manufacturing a semiconductor device, comprising the steps of:
forming a first part of said semiconductor device on a Si substrate, said first part being made of Si;
forming, on said first part, a second part of said semiconductor device of a semiconductor material having an energy gap larger than that of Si;
covering said second part with a Si film;
ion-implanting an element at the interface of said second part and said Si film and a periphery portion of said interface,

said element forming a compound with said semiconductor material, said compound having an energy gap smaller than that of said semiconductor material; and



forming electrodes on said first part and on said Si film, respectively.

4,983,535

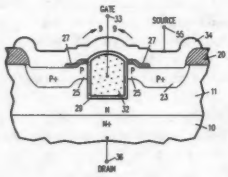
VERTICAL DMOS TRANSISTOR FABRICATION PROCESS

Richard A. Blanchard, Los Altos, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 109,388, Oct. 15, 1981, abandoned. This application Dec. 28, 1988, Ser. No. 292,668

Int. Cl.[5] H01L *21/335*

U.S. Cl. 437—40 **5 Claims**



1. A process for fabricating a vertical DMOS transistor, having source, drain, gate and body regions, comprising the steps:

providing a high conductivity semiconductor substrate wafer having a first conductivity type and a similar conductivity type epitaxial layer thereon;

forming an opposite conductivity type body region extending part way through said epitaxial layer;

forming a heavily doped opposite conductivity type region surrounding said body region to define said DMOS transistor and to provide a deep body contact;

forming a refractory metal layer over said body region to provide a contact thereto;

forming a gate region within said body region by etching a trench in said epitaxial layer to completely penetrate said body region, forming a gate oxide on the walls of said trench, filling said trench with doped polysilicon and removing the excess polysilicon to leave said trench filled with conductive polysilicon to provide said gate electrode of said DMOS transistor; and

forming contacts to said refractory metal, said conductive polysilicon, said deep body contact region and said substrate wafer,

wherein said refractory metal acts as said source of said DMOS transistor, and

wherein said refractory metal also forms an ohmic connection to said deep body contact region.

4,983,536

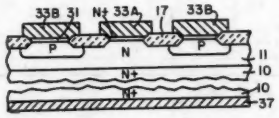
METHOD OF FABRICATING JUNCTION FIELD EFFECT TRANSISTOR

Emel S. Bulat, Framingham, and Marvin J. Tabasky, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 24, 1989, Ser. No. 440,930

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—40 **8 Claims**



1. The method of fabricating a junction field effect transistor comprising

providing a body of silicon including a substrate of silicon of one conductivity type of relatively low resistivity and a layer of silicon of the one conductivity type of relatively high resistivity contiguous with said substrate, said layer having a surface at a surface of the body;

forming a layer of adherent, nonconductive protective material adherent at said surface having openings therein exposing alternating source surface areas and gate surface areas;

introducing conductivity type imparting material of the opposite conductivity type into said layer of silicon of the one conductivity type of relatively high resistivity from said gate surface areas to produce gate regions of the opposite conductivity type in said layer of silicon of the one conductivity type of relatively high resistivity at said gate surface areas;

introducing conductivity type imparting material of the one conductivity type into said layer of silicon of the one conductivity type of relatively high resistivity from said source surface areas to produce source regions of the one conductivity type of lower resistivity in said layer of silicon of the one conductivity type of relatively high resistivity at said source surface areas;

placing germanium at said source surface areas and said gate surface areas;

forming a germanium-silicon composite of the germanium with underlying silicon at the source surface areas and the gate surface areas; and

applying conductive material to form source and gate contacts in ohmic contact with the germanium-silicon composite at the source and gate regions, respectively.

4,983,537

METHOD OF MAKING A BURIED OXIDE FIELD ISOLATION STRUCTURE

Ching-Yeu Wei, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 246,068, Sep. 16, 1988, Pat. No. 4,903,107, which is a continuation of Ser. No. 947,340, Dec. 29, 1986, abandoned. This application Nov. 24, 1989, Ser. No. 440,962

Int. Cl.[5] H01L *21/76*

U.S. Cl. 437—69 **18 Claims**

14. A process for achieving buried oxide field isolation n a silicon structure comprising the steps of:

applying a first mask to a silicon substrate so as to cover a predetermined active region of the substrate;

reactive ion etching an exposed field region of the silicon

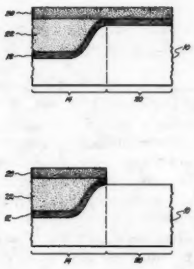
substrate in a manner which produces a trench in the silicon substrate with a curved side wall;

removing the mask;

thermally oxidizing the silicon substrate to provide a thermal SiO_2 layer over the entire surface of the silicon substrate;

chemical vapor depositing SiO_2 over the entire thermal SiO_2 layer of sufficient thickness to fill up the trench;

applying a double resist layer atop the chemical vapor deposited SiO_2 layer, said double resist layer including a photoresist mask over the field region, and a spin coated photoresist mask thereon for planarization;



etching the double resist layer and oxide simultaneously at the same rate until the double resist layer is completely removed and the chemical vapor deposited SiO_2 above the active region is removed so as to provide a planarized surface;

chemical vapor depositing a layer of SiO_2 over the planarized surface of the structure;

masking over the field region and the curved side wall of the trench; and

etching the unmasked portions of the chemical vapor deposited SiO_2 layer and thermal SiO_2 layer down to the silicon substrate.

4,983,538

METHOD FOR FABRICATING A SILICON CARBIDE SUBSTRATE

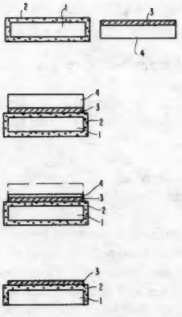
Hiroshi Gotou, Niiza, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 16, 1988, Ser. No. 271,878

Claims priority, application Japan, Nov. 20, 1987, 62-294617

Int. Cl.[5] H01L *21/18, 21/302*

U.S. Cl. 437—100 **26 Claims**



1. A method for fabricating a semiconductor substrate having a semiconductor on insulator structure, said semiconductor being beta type silicon carbide, said method comprising the steps of:

(a) preparing a first substrate made of a first semiconductor material, and a second substrate made of silicon single crystal;

(b) forming a layer of beta type silicon carbide single crystal on a surface of said second substrate;

(c) coating a surface of said first substrate with an insulator layer;

(d) stacking said second substrate on said first substrate juxtaposing said beta type silicon carbide layer to said first substrate;

(e) bonding said first substrate and said second substrate together by heating in an inert gas ambient; and

(f) removing said second substrate to expose said beta type silicon carbide layer.

4,983,539

PROCESS FOR PRODUCING A SEMICONDUCTOR ARTICLE

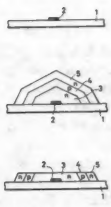
Kenji Yamagata, Yokohama, and Takeshi Ichikawa, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 159,919, Feb. 24, 1988, abandoned. This application Apr. 13, 1990, Ser. No. 508,490

Claims priority, application Japan, Feb. 28, 1987, 62-044103; Mar. 26, 1987, 62-070468

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—110 **9 Claims**



1. A process for producing a semiconductor article comprising a monocrystal having at least two crystal regions differing in electrical characteristics, said process comprising the steps of:

preparing a substrate having a free surface including a nonnucleation surface and an adjacently positioned nucleation surface of an amorphous material having a greater nucleation density than said nonnucleation surface and having a surface area sufficiently small so as to form only a single nucleus from which said monocrystal is grown;

applying a first set of crystal growing conditions to said substrate during single nucleus formation to form a first crystal region of said monocrystal which is grown from said amorphous nucleation surface; and

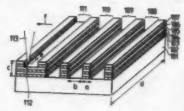
applying a second set of crystal growing conditions to said substrate to form a second crystal region of said monocrystal.

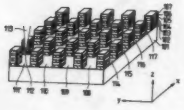
4,983,540

METHOD OF MANUFACTURING DEVICES HAVING SUPERLATTICE STRUCTURES

Hiroshi Yamaguchi, Fujisawa; Keiya Saito, Yokohama; Fumikazu Itoh, Fujisawa; Koji Ishida, Musashino; Shinji Sakano, Hachiouji; Masao Tamura, Tokorozawa; Shoji Shukuri, Koganei; Tohru Ishitani, Sayama, and Tsuneo Ichiguchi, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,012
Claims priority, application Japan, Nov. 24, 1987, 62-294061
Int. Cl.[5] H01L *21/20, 21/265*
U.S. Cl. 437—110 27 Claims





1. A method of manufacturing a device of superlattice structure, comprising:

(i) the step of preparing a one-dimensional superlattice structure in which well layers and potential barrier layers are alternately stacked;

(ii) the step of generating a focused ion beam; and

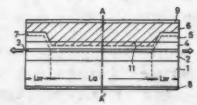
(iii) the step of bombarding the superlattice layers of said one-dimensional superlattice structure by said ion beam, and scanning said ion beam rectilinearly in a direction of said superlattice layers, so as to form at least two parallel grooves by the bombardment of the scanned ion beam, thereby to provide potential barrier layers.

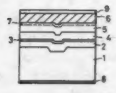
4,983,541

SEMICONDUCTOR LASER DEVICE FABRICATION

Hisao Kumabe, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Division of Ser. No. 338,341, Apr. 13, 1989, Pat. No. 4,890,292, which is a continuation of Ser. No. 222,375, Jul. 19, 1988, abandoned, which is a continuation of Ser. No. 89,085, Aug. 25, 1987, abandoned. This application Nov. 13, 1989, Ser. No. 437,376
Claims priority, application Japan, Sep. 2, 1986, 61-207339
Int. Cl.[5] H01L *29/205*
U.S. Cl. 437—129 1 Claim





1. A method for fabricating a semiconductor laser device comprising the steps of:

forming a U-shaped stripe groove on an upper surface of a first-conductivity type semiconductor crystal substrate in a resonator direction;

forming a first-conductivity type lower cladding layer on said substrate, which is bent along said groove;

forming a first-conductivity type active layer on said lower cladding layer, which is bent along said groove, refractive index of said active layer being larger than that of said lower cladding layer;

forming a second-conductivity type upper cladding layer on said active layer, which is bent along said groove, refractive index of said upper cladding layer being smaller than that of said active layer and forbidden band width of said upper cladding layer being larger than that of said active layer;

forming a first-conductivity type current blocking layer on said upper cladding layer, which is bent along said groove;

forming a rectangular groove at a center portion, except neighborhood of resonator mirrors, of said current blocking layer, so that a part of said upper cladding layer is exposed at a bottom of said rectangular groove; and

forming a second-conductivity type contact layer on said current blocking layer and on said upper cladding layer in said rectangular groove successively, and simultaneously diffusing impurities at a center portion, except neighborhood of the resonator mirrors, of said active layer to thereby make forbidden band width of the diffusion region smaller.

4,983,542

METHOD FOR PRODUCING THE XBAI RESTRICTION ENDONUCLEASE AND METHYLASE

Elizabeth M. Van Cott, Salem, and Geoffrey G. Wilson, Boxford, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Dec. 21, 1987, Ser. No. 136,093
Int. Cl.[5] C12N *15/51, 9/22, 1/21*
U.S. Cl. 435—172.3 10 Claims

1. Isolated DNA coding for the XbaI restriction endonuclease, wherein the isolated DNA is obtainable from the vector pEC145RM102-18/39.

4,983,543

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT HAVING AN INTERCONNECTION WIRE EMBEDDED IN A PROTECTIVE LAYER COVERING THE SEMICONDUCTOR INTEGRATED CIRCUIT

Yasuhisa Sato, Isehara, and Takushi Motoyama, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 1, 1989, Ser. No. 401,690
Claims priority, application Japan, Sep. 7, 1988, 63-222273; Nov. 16, 1988, 63-289208; Dec. 23, 1988, 63-326687
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—192 14 Claims

1. A method of manufacturing a semiconductor integrated circuit, comprising steps of:

forming at least one semiconductor device on a substrate;

depositing an insulator layer on the substrate so as to bury said semiconductor device;

providing a contact hole through the insulator layer for exposing a desired part of the semiconductor device;

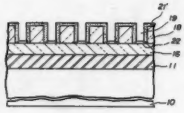
filling the contact hole by a refractory metal for electrical connection;

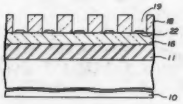
covering the insulator layer by a second insulator layer;

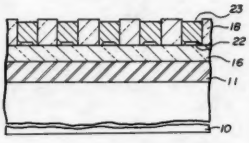
forming a groove through the second insulator layer according to a predetermined interconnection pattern such that the groove passes at least one contact hole and such that a top surface of the refractory metal filling the contact hole and a top surface of the first insulator layer are exposed by the groove;

forming a material layer acting as a nuclei for crystal growth

of a second refractory metal at a bottom of the groove substantially continuously along the groove, said step of forming the material layer acting as nuclei comprising consecutive steps of depositing a first material forming said material layer such that a side wall and the bottom of







the groove are covered, and selectively removing the first material from the side wall; and

depositing the second refractory metal in the groove until the groove is substantially filled by a conductor of the second refractory metal.

4,983,544

SILICIDE BRIDGE CONTACT PROCESS

Nicky C. Lu, Yorktown Heights, N.Y.; Brian J. Machesney, Burlington, Vt.; Rick L. Mohler, Williston, Vt.; Glen L. Miles, South Burlington, Vt.; Chung-Yu Ting, Katonah, N.Y., and Stephen D. Warley, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1986, Ser. No. 920,471

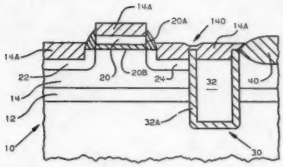
Int. Cl.[5] H01L *21/44*

U.S. Cl. 437—200 **24 Claims**

1. A method of forming a bridge contact between silicon regions on a substrate that are separated by a first insulating region having a first lateral length, without forming a bridge contact between silicon regions on the substrate that are separated by other insulating regions that have lateral lengths that are greater than that of said first insulating region, comprising the steps of:

forming a refractory metal layer on the substrate under conditions so that said metal layer has a grain shape in which lower portions of the grains have a lateral length that approximates the lateral length of said first insulating region;

sintering the substrate under conditions that limit lateral silicon diffusion, so that a silicide is formed over all of said silicon regions and said first insulation region without forming a silicide over said other insulating regions; and



exposing the substrate to an etchant that preferentially removes portions of said refractory metal that did not react to form said silicide, without appreciably removing said silicide.

4,983,545

PLANARIZATION OF DIELECTRIC FILMS ON INTEGRATED CIRCUITS

Hiroshi Gokan; Masahito Mukainaru; Masayoshi Suzuki; Hisanao Tsuge, all of Tokyo, and Hidehiko Matsuya, Kyoto, all of Japan, assignors to NEC Corporation, Tokyo and Sanyo Chemical Industries, Ltd., Kyoto, both of, Japan

Filed Mar. 18, 1988, Ser. No. 170,304

Claims priority, application Japan, Mar. 20, 1987, 62-67527; Oct. 30, 1987, 62-276518

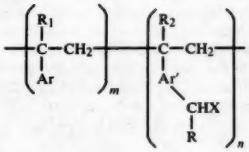
Int. Cl.[5] H01L *21/465*

U.S. Cl. 437—228 **20 Claims**

1. A method for producing a semiconductor structure over a substrate having a pattern thereon, said pattern comprising mesa-like portions having a trench region therebetween, the steps comprising:

(a) forming a dielectric film over the mesa-like portions and the trench region;

(b) forming a polymer layer over said dielectric film, said polymer layer comprising a polymer having a melting viscosity of 5000 cps or less at 200° C. and the formula:



in which:

R_1 is a hydrogen atom, a methyl radical or a halogen atom;

R_2 is a hydrogen atom, a methyl radical or a halogen atom;

R is a hydrogen atom or a methyl radical;

X is a halogen atom;

Ar is a phenyl radical;

Ar' is a phenylene radical;

m and n are zero or a positive integer, each of which can not be zero at the same time, wherein the ratio of n/m is not less than 5/95;

(c) reducing the viscosity of said polymer layer under baking to create a substantially planar surface;

(d) hardening the polymer with radiation or an electron beam to improve the heat resistance of said polymer layer; and

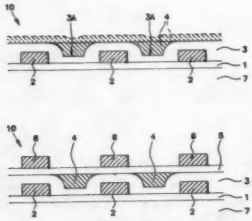
(e) dry-etching said polymer layer to transfer the planar surface to said dielectric film.

4,983,546

METHOD FOR CURING SPIN-ON-GLASS FILM BY UTILIZING ULTRAVIOLET IRRADIATION

Il S. Hyun; Hae S. Park; Chung G. Choi; Ho G. Ryoo, all of Seoul; Jai O. Koh, Kyungki-Do; Sang I. Kim, Seoul; Sung K. Park, Kyungki-Do; Yung M. Koo, Seoul; Young I. Kim, Seoul, and Sea C. Kim, Seoul, all of Rep. of Korea, assignors to Hyundai Electronics Industries, Co., Ltd., Kyungki, Rep. of Korea

Filed Dec. 20, 1989, Ser. No. 453,781
Claims priority, application Rep. of Korea, Dec. 20, 1988, 88-17008
Int. Cl.[5] H01L *21/469*
U.S. Cl. 437—231 6 Claims



1. A method for curing SOG a spin-on-glass formed on a wafer film which is formed in order to insulate the metal layers from each other and to flatten the step difference in the process for manufacturing a multilayered metal layer of a highly integrated semiconductor device comprising:

establishing in a heating chamber which includes an ultraviolet light source a predetermined initial temperature;

introducing a wafer, on which a SOG film to be cured is formed, into the heated chamber and increasing the temperature gradually to a predetermined maximum temperature;

irradiating the SOG film with ultraviolet light at a predetermined wavelength while maintaining the maximum temperature for a predetermined time; and

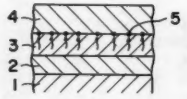
cooling the wafer.

4,983,547

METHOD OF FORMING A SILICIDE FILM

Junichi Arima; Yoshihiro Hirata; Hiroshi Harada; Isao Furuta; Shigeru Harada, and Reiji Tamaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 927,379, Nov. 6, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 260,390
Claims priority, application Japan, Nov. 9, 1985, 60-251061
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—246 21 Claims



1. A method of forming and controlling the composition ratio of a metallic silicide film on a substrate, the method comprising the steps of:

(a) sputtering $MoSi_x$ with $2 \leqq x \leqq 3$ onto the substrate to form a $MoSi_x$ layer at a concentration higher than stoichiometric;

(b) depositing a film of either aluminum or aluminum alloy at selected areas on said $MoSi_x$ layer where a more nearly stoichiometric composition is desired;

(c) conducting a heat treatment at a temperature between about 350° and about 550° C. to cause precipitation of Si from said $MoSi_x$ layer to said film at said selected areas; and

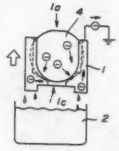
(d) stripping said film having precipitated Si thereby leaving said $MoSi_x$ layer with said selected areas having said more nearly stoichiometric composition.

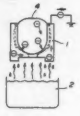
4,983,548

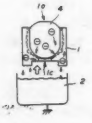
METHOD OF FABRICATING A SEMICONDUCTOR DEVICE INCLUDING REMOVAL OF ELECTRIC CHARGES

Masaaki Uno, Kawasaki; Masanori Kobayashi, Tokyo, and Kazushi Nakashima, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed May 16, 1990, Ser. No. 524,107
Claims priority, application Japan, May 17, 1989, 1-123048
Int. Cl.[5] H01L *21/306*
U.S. Cl. 437—250 8 Claims







1. A method of fabricating a semiconductor device, comprising steps of:

accommodating a substrate on which the semiconductor device is to be fabricated in a container of an electrically insulating material;

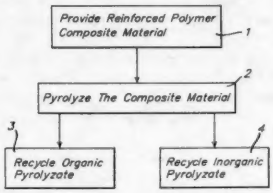
forming a film of a volatile organic solvent such that the film covers substantially an entire surface of the container and the substrate accommodated therein, said step of forming the film being performed while maintaining a connection between the film of the volatile organic solvent covering the surface of the container and the ground, so that electric charges are eliminated from the substrate and the container by flowing to the ground; and

removing the film of the volatile organic solvent by evaporating the solvent.

4,983,549
METHOD FOR RECYCLING PLASTIC COMPOSITE MATERIALS

Bruce N. Greve, Davisburg, Mich., assignor to The Budd Company, Troy, Mich.

Filed Sep. 22, 1988, Ser. No. 247,747
Int. Cl.[5] C03C *6/00*
U.S. Cl. 501—27 **59 Claims**



1. A method for recycling a reinforced plastic composite material comprising the steps of:

(a) providing a reinforced plastic composite material having a reinforcement material including inorganic constituents and a plastic matrix material therein;

(b) pyrolyzing said reinforced plastic composite material to separate said plastic matrix material from said reinforcement material; and

(c) forming a virgin glass material from said inorganic constituents of said separated reinforcement material.

43. A new method for recycling a reinforced plastic composite material comprising the steps of:

(a) providing a reinforced plastic composite material having a reinforcement material including inorganic constituents and a plastic matrix material therein;

(b) combusting said reinforced plastic composite material to separate said plastic matrix material from said reinforcement material; and

(c) forming a virgin glass material from said inorganic constituent of said separated reinforcement material.

4,983,550
HOLLOW GLASS SPHERES

Kenneth E. Goetz, Maplewood, N.J.; James A. Hagarman, Audubon, Pa., and Joseph P. Giovene, Jr., Belleville, N.J., assignors to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Aug. 24, 1988, Ser. No. 236,042
Int. Cl.[5] C03C *12/00*
U.S. Cl. 501—33 **29 Claims**

1. Hollow glass spheres made by heating solid glass particles, said spheres having average densities of approximately 0.10 grams/cc to approximately 2.0 grams/cc and consisting essentially of the following ingredients in the following amounts stated as weight percentages:

SiO_2	50–57
R_2O	2–15
B_2O_3	0–20
S	.05–1.5
RO	2–25
RO_2 other than SiO_2	0–5
R_2O_3 other than B_2O_3	0–10
R_2O_5	0–5
F	0–5,

wherein R represents a metal or other element, having a valence of 1, 2, 3, 4, or 5 as dictated by the formulae set forth above, which combines with oxygen, and
wherein the hollow glass spheres have a gradient quotient of 0.8 to 1.3.

13. A product of hollow and solid glass spheres made by heating solid glass particles, said product having an average density of approximately 0.10 grams/cc to approximately 2.0 grams/cc and consisting essentially of the following ingredients in the following amounts stated as weight percentages:

SiO_2	50–57
R_2O	2–15
B_2O_3	0–20
S	.05–1.5
RO	2–25
RO_2 other than SiO_2	0–5
R_2O_3 other than B_2O_3	0–10
R_2O_5	0–5
F	0–5,

wherein R represents a metal or other element, having a valence of 1, 2, 3, 4, or 5 as dictated by the formulae set forth above, which combines with oxygen, and
wherein the hollow glass spheres have a gradient quotient of 0.8 to 1.3.

27. An article of manufacture comprising a polymeric compound and dispersed therein the hollow glass spheres made by heating solid glass particles, said spheres having average densities of approximately 0.10 grams/cc to approximately 2.0 grams/cc and consisting essentially of the following ingredients in the following amounts stated as weight percentages:

SiO_2	50–57
R_2O	2–15
B_2O_3	0–20
S	.05–1.5
RO	2–25
RO_2 other than SiO_2	0–5
R_2O_3 other than B_2O_3	0–10
R_2O_5	0–5
F	0–5,

wherein R represents a metal or other element, having a valence of 1, 2, 3, 4, or 5 as dictated by the formulae set forth above, which combines with oxygen, and
wherein the hollow glass spheres have a gradient quotient of 0.8 to 1.3.

28. An article of manufacture comprising a polymeric compound and dispersed therein the product of hollow and solid glass spheres made by heating solid glass particles, said product having an average density of approximately 0.10 grams/cc to approximately 2.0 grams/cc and consisting essentially of the following ingredients in the following amounts stated as weight percentages:

SiO_2	50–57
R_2O	2–15
B_2O_3	0–20
S	.05–1.5
RO	2–25
RO_2 other than SiO_2	0–5
R_2O_3 other than B_2O_3	0–10
R_2O_5	0–5
F	0–5,

wherein R represents a metal or other element, having a valence of 1, 2, 3, 4, or 5 as dictated by the formulae set forth above, which combines with oxygen, and wherein the hollow glass spheres have a gradient quotient of 0.8 to 1.3.

4,983,551

CHANNEL ELECTRON MULTIPLIERS

W. Bruce Feller, Sturbridge, and Lee M. Cook, Spencer, both of Mass., assignors to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Aug. 18, 1988, Ser. No. 234,325
Int. Cl.[5] C03C 3/07
U.S. Cl. 501—74 2 Claims

1. Glass consisting essentially of, in weight percent:

SiO_2	30–35%
PbO	50–57%
Cs_2O	2–10%
$\Sigma MgO + CaO + SrO + BaO$	0–5%
$\Sigma Al_2O_3 + ZrO_2 + TiO_2 + Nb_2O_5$	0.1–1%,

wherein the ratio of Si to Pb, expressed as the molar ratio of SiO_2 to PbO, is 2.0–2.4.

4,983,552

METHOD FOR MAKING ORGANOSILAZANES

Anthony A. Gallo, Olean, N.Y., assignor to The Dexter Corporation, Windsor Locks, Conn.

Division of Ser. No. 936,473, Nov. 26, 1986, Pat. No.
Int. Cl.[5] C04B 35/56, 35/58
U.S. Cl. 501—92 14 Claims

1. A method of preparing silicon nitride-silicon carbide ceramic materials comprising the steps of

forming an organosilazane by reacting

(a) a first halosilane having the formula RR^1SiX_2, wherein X is F, Cl, Br, or I, and each R and R^1, independently, is X, H, or a lower alkyl group; and

(b) a first primary amine compound having the formula R^2NH_2, wherein R^2 is H or a lower alkyl group to form a reaction product; and

(c) reacting said reaction product with a second primary amine compound having the formula R^3NH_2, wherein R^3 is H or a lower alkyl group, R^3 being different from R^2, to form said organosilazane;

heating said organosilazane in an inert atmosphere to form a polysilazane; and

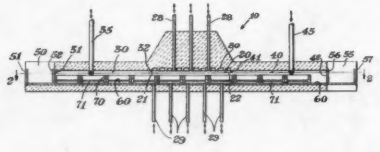
heating said polysilazane in an inert atmosphere to form said ceramic material.

4,983,553

CONTINUOUS CARBOTHERMAL REACTOR

David A. Dunn; Michael S. Paquette, both of Midland, Mich.; Henry Easter, Atkins, and Roger K. Pihlaja, Russellville, both of Ark., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1989, Ser. No. 447,310
Int. Cl.[5] C04B 35/38
U.S. Cl. 501—96 11 Claims



1. A method for continuously producing aluminum nitride via carbothermal reduction of aluminum oxide, the method comprising:

(a) providing at least one discrete aliquot of solid reactant material, each aliquot being disposed within a separate container, each container having defined therein a means for receiving gaseous reactants and distributing said gaseous reactants in a generally uniform manner throughout said aliquot, said solid reactant materials comprising aluminum oxide and, optionally, carbon, said gaseous reactants comprising nitrogen and, optionally, a source of carbon;

(b) passing the container(s) at least once through a heated reaction zone at a rate and for a period of time sufficient to heat said aliquot to a temperature sufficient to initiate a reaction between the gaseous reactants and solid reactant materials to produce aluminum nitride;

(c) supplying the gaseous reactants to said container at a rate sufficient to convert the solid reactant materials to aluminum nitride;

(d) removing gaseous reaction products from the reaction zone at a rate sufficient to form aluminum nitride with a controlled particle size and substantially preclude formation of aluminum oxynitride or aluminum oxycarbide.

4,983,554

SILICON NITRIDE CERAMIC CONTAINING MOLYBDENUM DISILICIDE

Martin Y. Hsieh, Palo Alto, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 2, 1990, Ser. No. 459,865
Int. Cl.[5] C04B 35/58
U.S. Cl. 501—97 4 Claims

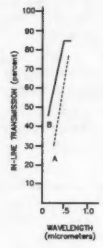
1. A sintered silicon nitride ceramic consisting of, in weight percent, 10.1 to 13.5 aluminum nitride, 6 to 7.5 yttrium oxide, 0.05 to 5 molybdenum disilicide, balance silicon nitride.

4,983,555

APPLICATION OF TRANSPARENT POLYCRYSTALLINE BODY WITH HIGH ULTRAVIOLET TRANSMITTANCE

Donald W. Roy, Golden, and James L. Hastert, Lakewood, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Continuation-in-part of Ser. No. 47,403, May 5, 1987, abandoned. This application Apr. 22, 1988, Ser. No. 185,189
Int. Cl.[5] C04B 35/02
U.S. Cl. 501—120 58 Claims



1. A sintered polycrystalline body consisting essentially of magnesia-alumina spinel produced by a process comprising:

providing a powder comprising magnesia-alumina spinel;

producing a closed porosity body from said powder; and

heating said closed porosity body to at least about 1400° C. at elevated pressure of at least about 20,000 psi to reduce residual porosity;

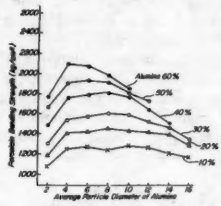
said body having a transmittance per 1.88 millimeter thickness in all wavelengths from about 0.3 to about 0.8 microns of not less than about 85 percent.

4,983,556

HIGH STRENGTH PORCELAINS FOR USE IN INSULATORS AND PRODUCTION THEREOF

Shoji Seike, Nagoya; Noriyasu Oguri, Hashima; Hiroshi Harada, Handa, and Junichi Ishikawa, Konan, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Feb. 24, 1988, Ser. No. 159,732
Claims priority, application Japan, Mar. 6, 1987, 62-50390
Int. Cl.[5] C04B *33/24, 35/10*
U.S. Cl. 501—143 2 Claims



1. A high strength procelain for use in insulators produced by:

mixing 20–60 wt % alumina powder which is decomposed in a single crystalline state, has a 50% average particle diameter of 4–14 microns, and has coarse particles with a particle diameter of not less than 44 microns present in an amount of greater than 0 wt % but less than 1 wt %, relative to the total weight of said alumina powder, with finely ground raw material selected from the group consisting of feldspar, silica sand, china stone, and clay, such that the resultant mixture of these components has a 50% average particle diameter of 3–10 microns;

shaping the resultant mixture to form a shaped body; drying the shaped body; and firing the dried, shape body; wherein quartz grains remaining in the porcelain have a maximum diameter of not greater than 40 microns.

4,983,557

PROCESS FOR PREPARING A HIGH-DENSITY AND MIDDLE-POROSITY CATALYST, SUPPORTED ON A SILICEOUS MATRIX, BASED ON VANADIUM

Luigi Cavalli, Novara, and Renzo Nardini, Vercelli, both of Italy, assignors to Ausimont, S.r.l., Italy

Filed Jan. 17, 1989, Ser. No. 297,345
Claims priority, application Italy, Jan. 18, 1988, 19097 A/88
Int. Cl.[5] B01J *23/92, 21/20, 23/22;* C01B *17/74*
U.S. Cl. 502—26 16 Claims

1. A process for the preparation of a high density regenerated silica catalyst for the oxidation of sulphur dioxide to sulphur trioxide, supported on a siliceous matrix, comprising vanadium, iron, oxygen and potassium, wherein the V_2O_5 content ranges from 6 to 9% by weight, wherein the K_2O content ranges from 8.5 to 12% by weight, wherein the particle density ranges from 0.90 to 1.40 g/cm and wherein:

the pore volume ranges from 0.20 to 0.70 cm^3/g and the surface area ranges from 0.30 to 3 m/g, the average radius of the pores being from 600 to 2,200 nanometers;

the silica (SiO_2) content is equal to or lower than 75% by weight and the Fe_2O_3 content is from 0.90% to 1.45% by weight; characterized in that:

(a) an exhausted catalyst poor as to catalytic elements, having a silica content lower than 75% by weight and a Fe_2O_3 content equal to or greater than 0.90% by weight, is ground until the average diameter of the particles is from 1 to 50 micrometers;

(b) the finely ground product, coming from step (a), is mixed with added siliceous material, the resulting mixture being then impregnated with an aqueous solution containing catalytic elements which replace those of the exhausted catalyst;

(c) the impregnated catalyst from step (b) is shaped, dried and calcined at temperatures from 270° C. to 600° C., in the presence of a reducing atmosphere comprising SO_2.

4,983,558

PROCESS FOR PRESULFURIZING A HYDROCARBON TREATMENT CATALYST

Maurice Born, Nanterre; Guy Parc, Rueil Malmaison, and Hervé Toulhoat, Houilles, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 16, 1989, Ser. No. 311,503
Claims priority, application France, Feb. 16, 1988, 88 01906
Int. Cl.[5] B01J *27/30, 27/049, 27/047, 27/043*
U.S. Cl. 502—31 17 Claims

1. A process for sulfurizing a new or regenerated hydrocarbon refining or hydroconversion catalyst containing a support which is at least one metal or metalloid oxide and at least one active metal, said process being conducted in the absence of hydrogen, wherein said catalyst is treated with at least one sulfurizing agent dissolved in a solvent, said agent being obtained by a process comprising: (a) reacting at least one compound selected from the group consisting of sulfur chloride and sulfur dichloride with at least one olefin or olefin mixture containing 2 to 12 atoms of carbon per molecule, to form an adduct; (b) mixing said adduct with at least one monohalogenated hydrocarbon compound; (c) reacting the product of step (b) with at least one alkali metal, ammonium or alkaline earth metal sulfide, hydrogensulfides, or polysulfide in an aqueous and/or alcoholic medium to form an olefin polysulfide containing from about 20 to about 70% by weight of sulfur.

4,983,559

PROCESS FOR PRESULFURIZING WITH PHOSPHOROUS AND/OR HALOGEN ADDITIVE

Georges Berrebi, Bourg les Valence, France, assignor to Europeene de Retraitement de Catalyseurs Eurecat, La Voulte sur Rhone, France

Filed Jul. 3, 1989, Ser. No. 375,431
Claims priority, application France, Jul. 1, 1988, 88 09049; Mar. 15, 1989, 89 03501
Int. Cl.[5] B01J *27/30, 27/188, 27/132, 27/047*
U.S. Cl. 502—32 5 Claims

1. In a process for the sulfurization of a new or regenerated hydrocarbon refining or conversion catalyst containing (a) a support with a base of at least one oxide of a metal or a metalloid and (b) at least one active metal, comprising:

(a) a first stage performed ex situ between about 0° and 50° C. and in the absence of hydrogen, in which the catalyst is treated with at least one sulfurizing agent so as to incorporate this agent partially or totally in the porosity of the catalyst, the sulfurizing agent being a polysulfide of the general formula:

$$R—S_{(n)}—R'$$

where n is an integer from 3 to 20 and where R and R' each represent an organic radical containing 1 to 150 carbon atoms per molecule, chosen from the group consisting of a saturated or unsaturated, straight or branched alkyl radical, a naphthenyl radical, an alkylaryl radical and an arylakyl radical, said sulfurizing agent being used in solution in a solvent, the catalyst then being optionally dried, and

(b) a second stage, in which the catalyst obtained in the first stage is treated, in the absence of hydrogen and in the presence of at least steam, moist air or a moist inert gas for at least about 5 minutes, in situ or ex situ, at a temperature between 65° and 275° C., under a pressure between about 0.5 and 70 bars (0.05 and 7 MPa), the catalyst at this stage optionally being dried,

the improvement comprising adding, during the first stage,

0.1 to 10% by weight, (weight expressed in elemental halogen or elemental phosphorus), relative to the weight of polysulfide or polysulfides of at least one additive chosen from the group consisting of phosphorus, a phosphorus compound, a halogen and a halogen compound.

4,983,560

MODIFIED ZEOLITE CATALYSTS

Richard G. Copperthwaite, Johannesburg; Themistoclis Themistocleous, Braamfontein, both of South Africa, and Graham J. Hutchings, North Yorkshire, England, assignors to Pratley Investments (Proprietary) Limited, Krugersdorp, South Africa

Filed Sep. 12, 1988, Ser. No. 242,903

Claims priority, application South Africa, Sep. 11, 1987, 87/6814

Int. Cl.[5] B01J *37/00, 29/06*

U.S. Cl. 502—85 **8 Claims**

1. A method for the modification of a natural clinoptilolite to produce a modified clinoptilolite for use in a reaction for the preparation of or transformation of hydrocarbons, the method including the step of treating the natural clinoptilolite with a suitable mineral acid at a concentration of greater than 1M for a treatment time of longer than 24 hours and at a suitable treatment temperature to produce the modified clinoptilolite.

4,983,561

PROCESS FOR PRODUCING SOLID CATALYST FOR USE IN POLYMERIZATION OF OLEFINS

Toshio Sasaki; Eiji Sogabe, and Takeshi Ebara, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 12, 1989, Ser. No. 406,275

Int. Cl.[5] C08F *4/646*

U.S. Cl. 502—107 **36 Claims**

1. A process for producing a trivalent titanium compound-containing solid catalyst for use in the polymerization of olefins which comprises treating, with a mono- or poly-valent carboxylic ester selected from the group consisting of aliphatic carboxylic esters, olefinic carboxylic esters, alicyclic carboxylic esters and aromatic carboxylic esters, a solid product obtained by reducing a titanium compound represented by the following general formula,

$$Ti(OR^1)_nX_{4-n}$$

wherein R^1 represents hydrocarbon group having 1 to 20 carbon atoms, X represents halogen atom, and n represents a number satisfying $0<n\leqq 4$ with an organomagnesium compound in the presence of an organic silicon compound having Si—O bond which has any of the general formulae,

$Si(OR^3)_mR^4_{4-m}$,

$R^5(R^6_2SiO)_pSiR^7_3$, and

$(R^8_2SiO)_q$

wherein R^3 represents hydrocarbon group having 1 to 20 carbon atoms; R^4, R^5, R^6, R^7 and R^8 each represents hydrocarbon group having 1 to 20 carbon atoms or hydrogen atom; m represents a number satisfying $0<m\leqq 4$; p represents an integer of 1 to 1,000; and q represents an integer of 2 to 1,000 to obtain an ester-treated solid product, and treating the ester-treated solid product with a mixture of the same mono- or poly-valent carboxylic ester as used in the step of producing the ester-treated solid product and titanium tetrachloride.

4,983,562

HIGH ACTIVITY CATALYST SYSTEM FOR THE PRODUCTION OF PROPYLENE POLYMERS

Kathleen D. Schramm, Somerville, and Frederick J. Karol, Belle Mead, both of N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Nov. 17, 1989, Ser. No. 437,816

Int. Cl.[5] C08F *4/646*

U.S. Cl. 502—112 **29 Claims**

1. A catalyst system comprising:

(i) a catalyst precursor, which includes: magnesium; titanium; a halogen, which is chlorine, bromine, or iodine, or a mixture thereof; one or two inside electron donors; and a cerium (IV) compound;

(ii) a hydrocarbylaluminum cocatalyst; and

(iii) a selectivity control agent wherein the atomic ratio of aluminum to titanium is in the range of about 5 to about 300 and the molar ratio of aluminum to selectivity control agent is in the range of about 0.1 to about 100.

4,983,563

MECHANICALLY IMPROVED SHAPED ARTICLES

Thierry Chopin, Saint Denis; Eric Quemere, Corneilles en Parisis; Patrice Nortier, Romainville; Jean-Luc Schuppiser, Claye Souilly, and Christian Segaud, Chassieu, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 20, 1988, Ser. No. 208,501

Claims priority, application France, Jun. 19, 1987, 87 08606

Int. Cl.[5] B01J *31/26*

U.S. Cl. 502—150 **14 Claims**

1. A process for the production of a shaped porous article having improved mechanical properties, which comprises shaping a mass of particulate material into the form of desired final porous article, said particulate material including an effective amount for improving mechanical properties of at least one polysaccharide compound, and the consolidating said shaped porous article by heat treating at a calcination temperature to provide a shaped porous article comprising a catalyst or a catalyst support.

4,983,564

METHOD OF MAKING CROSSLINKED LAYERED COMPOUNDS

Kenneth P. Callahan, Cupertino, and Martin B. Dines, deceased, late of Laguna Beach, both of Calif. (by Elaine Dines, legal representative), assignors to Occidental Research Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 614,111, May 24, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,244

Int. Cl.[5] B01J *31/00;* B05D *7/00;* B32B *3/06*

U.S. Cl. 502—166 **26 Claims**

6. A process for preparing a catalyst comprising a moiety having catalytic activity intercalated between the layers of a layered crystalline material, said catalyst being characterized as resistant to egress of said moiety from between said layers, which process comprises the steps of:

(a) intercalating a moiety having catalytic activity into the layers of a compound selected from the group consisting of compounds represented by the general formula:

$$M(O_3ZO_xR)_n$$

wherein M is a tetravalent metal; Z is a pentavalent atom; x varies from 0 to 1; R is a radical selected from the group consisting of hydrogen and organo radicals; and n varies from >1 to 2;

said compound being characterized as a layered crystalline material comprising contiguous layers, each of said layers being spaced from and substantially unconnected to its neighboring layer to thereby allow access of said moiety into the interior of said crystalline material, and

(b) crosslinking said layers to thereby connect said contigu-

ous layers to neighboring layers and hinder egress of said moiety from the interior of said crystalline material.

4,983,565

CATALYST FOR THE PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES AND METHOD OF PREPARING THE CATALYST

John F. Knifton, and Wei-Yang Su, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Dec. 19, 1988, Ser. No. 285,926
Int. Cl.[5] B01J *21/06, 23/02, 23/28, 23/30*
U.S. Cl. 502—242 15 Claims

1. As a new composition of matter, a catalytically active phosphorous-free pelleted composition, said composition having been prepared by the method which consists essentially of impregnating titania pellets with an aqueous solution consisting essentially of:

a. an acid or a hydrate thereof selected from the group consisting of tungstosilicic acid and molybdosilicic acid, and their alkali metal, alkaline earth metal, aluminum and Group IB metal salts,

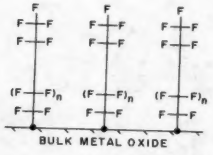
b. thereafter drying and calcining said thus-treated titania pellets to thereby provide a catalyst composition consisting essentially of titania pellets having from about 0.1 to about 10 wt. % of silicon and about 0.1 to about 30 wt. % of tungsten or molybdenum deposited on the said impregnated titania pellets.

4,983,566

SURFACE-MODIFIED ADSORBENT COMPRISING METAL OXIDE/HYDROXIDE PARTICLES REACTED WITH ONE OR MORE PERFLUORINATED ORGANIC ACIDS

Larry F. Wieserman; Karl Wefers, both of Apollo; Kathryn Cross, Murrysville, and Edward S. Martin, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 23,423, Mar. 9, 1987, Pat. No. 4,788,176, which is a continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,131
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] B01J *20/22, 20/32;* B01D *15/08;* B32B *9/00*
U.S. Cl. 502—401 19 Claims



1. An active material comprising a metal oxide/hydroxide particle material reacted with a perfluorinated organic acid to bond a substantially monomolecular layer thereof to a surface of said oxide/hydroxide, said organic acid selected from the class consisting of perfluorinated phosphonic acid having the formula $RPO(OH)_2$, and perfluorinated phosphinic acid having the formula $RR'PO(OH)$, perfluorinated carboxylic acid having the formula RCOOH, and mixtures thereof, where R comprises a perfluorinated carbon-containing group and R' comprises a perfluorinated carbon-containing group, each perfluorinated carbon-containing group of said perfluorinated organic acid being oriented away from said metal oxide/hydroxide surface said element selected from the class consisting of Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, W, Mn, Tc, Re, Fe, Ru, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, B, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb and Bi, elements in the lanthanide series and the actinide series, mixtures thereof, and mixtures of Be, Mg, Ca, Sr, Ba, Ra, Se, Te and Po.

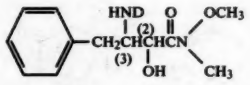
4,983,567

IMMUNOMODULATORS AND METHODS OF MAKING SAME

Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

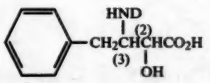
Division of Ser. No. 25,850, Mar. 16, 1987, Pat. No. 4,871,870.
This application May 25, 1989, Ser. No. 357,179
Int. Cl.[5] C07C *83/10*
U.S. Cl. 562—623 6 Claims

1. A method of synthesizing a first compound having the formula



where d is an acyl group having 1–6 , inclusive, carbon atoms or an arylacyl group having 7–12, inclusive, carbon atoms, said method comprising the steps of

(1) providing a second compound having the formula



wherein D is as defined above; and

(2) condensing said second compound with N,O-dimethyl hydroxylamine hydrochloride, or a salt thereof, to form said first compound.

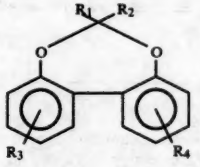
4,983,568

THERMOSENSITIVE RECORDING MATERIALS

Mitsuhiro Ikeda, Abiko, Japan, assignor to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,862
Claims priority, application Japan, Sep. 29, 1988, 63-246751
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—208 7 Claims

1. A thermosensitive recording material comprising an underlying substrate, an ordinarily colorless or slightly colored dye precursor, an electron receptive compound (developer) coloring said dye precursor by reacting when heated, and a compound of following general formula (I)



(I)

wherein R_1 and R_2 each represents hydrogen atom, alkyl, alkenyl or aryl group, and R_1 and R_2 may be different from each other; R_1 and R_2 may also be linked together to form cycloalkyl, cycloether, R_3 and R_4 each represents hydrogen atom, alkyl, alkenyl, alkoxy or aryl group and halogen atom, and R_3 and R_4 may be different from each other.

4,983,569

RECORDING MATERIAL

Shigetoshi Hiraishi, Tokyo; Mitsuru Fuchigami; Masahiro Miyauchi, both of Takasago, and Kazuo Kabashima, Yokohama, all of Japan, assignors to Mitsubishi Paper Mills, Tokyo and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Continuation of Ser. No. 122,191, Nov. 18, 1987, Pat. No. 4,880,767. This application Jul. 12, 1989, Ser. No. 379,789

Claims priority, application Japan, Nov. 18, 1986, 61-273009

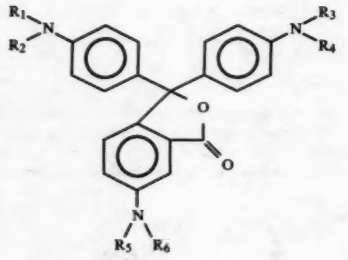
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—217 11 Claims

1. A recording material which comprises a color forming layer containing a color forming system comprising

(A) (a) a colorless or light-colored dye precursor represented by the formula:



(I)

wherein R_1 through R_6 are independently a lower alkyl group,

(b) a color developer which can form a color by reacting with the dye precursor, and

(B) (c) an isocyanate compound having aromaticity, and

(d) an imino compound having at least one >C=NH group, said color forming layer being carried on a support.

4,983,570

METHOD FOR FORMING A THIN LAYER OF SUPERCONDUCTING MATERIAL ON A SUBSTRATE AND ARTICLE PRODUCED THEREBY

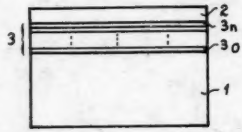
Gérard Creuzet, and Alain Friederich, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 30, 1988, Ser. No. 214,047

Claims priority, application France, Jul. 3, 1987, 87 09462

Int. Cl.[5] B05D *5/12*; C23C *16/00*

U.S. Cl. 505—001 11 Claims



1. A method for forming a thin film layer of superconducting materials on a substrate, comprising epitaxially growing metal oxides and rare earth oxides or raw unoxidized elements on a substrate such that a layer is obtained whose material has a lattic parameter corresponding substantially to a multiple or a sub-multiple of the lattice parameter of the substrate, oxidizing the epitaxially grown layer and covering the oxidized epitaxially grown layer with an oxygen impermeable material, said layer having superconductivity at a high critical temperature.

4,983,571

METHOD OF PRODUCING $YBA_2CU_3O_{6+x}$ SUPERCONDUCTORS WITH HIGH TRANSITION TEMPERATURES

A. Srinivasa Rao, Arnold; Om P. Arora, Silver Spring, and Louis F. Aprigliano, Riva, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1990, Ser. No. 472,008

Int. Cl.[5] H01L *39/12*

U.S. Cl. 505—1 14 Claims

1. A method for making an improved ceramic superconductor comprising:

(a) mixing an oxide selected from the group consisting of Y_2O_3, Er_2O_3, Eu_2O_3, Yb_2O_3, Dy_2O_3 and Ho_2O_3 with barium carbonate and copper oxide powders in a ratio of about 50 grams in the case of Y_2O_3, 83 grams for Er_2O_3, 76 grams for Eu_2O_3, 86 grams for Yb_2O_3, 80 grams for Dy_2O_3, 82 grams of Ho_2O_3 to about 70 grams of $BaCO_3$ to about 105 grams of CuO,

(b) ball milling the mixture with zironia balls for at least one hour;

(c) calcining the mixture at a temperature of 940°C.+or−2° C. with a heating sequence of 2° C. per minute from room temperature to 200° C.,

(d) maintaining the mixture at the 200° C. temperature for at least about sixty minutes,

(e) heating the mixture at 3° C. per minute until a temperature of 940° C.+or −2° C. is reached,

(f) maintaining the mixture at the 940° C.+or−2° C. for three hundred minutes,

(g) cooling the mixture to room temperature at a rate of 1° C. per minute,

(h) adding silver oxide in powdered form to the mixture in an amount of from about 1 to about 20 weight percent,

(i) ball milling the mixture containing silver oxide for at least one hour,

(j) compacting the mixture,

(k) sintering the mixture at 920° C.+or=2° C. by heating the mixture at 2° C. per minute from room temperature to 200° C., maintaining the temperature at 200° C. for 60 minutes and then resuming the heating at 3° C. per minute until a temperature of 920° C. is reached,

(l) maintaining the mixture at 920° C.+or−2° C. for three hundred minutes, and

(m) cooling the mixture to room temperature at a rate of 1° C. per minute.

4,983,572

SUPERCONDUCTIVE BODY

Gijsbertus De With, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,589

Claims priority, application Netherlands, Sep. 2, 1987, 8702059

Int. Cl.[5] H01B *12/00*

U.S. Cl. 505—1 5 Claims

1. A superconductive body comprising a matrix consisting essentially of an oxidic superconductive material in which there are mixed finely divided particles which parrticles consist of a core of a ceramic material and a cladding of metal.

4,983,573

PROCESS FOR MAKING 90° K. SUPERCONDUCTORS BY IMPREGNATING CELLULOSIC ARTICLE WITH PRECURSOR SOLUTION

John D. Bolt, Landenberg, Pa., and Munirpallam A. Subramanian, New Castle, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 60,079, Jun. 9, 1987. This application Mar. 13, 1989, Ser. No. 323,366

Int. Cl.[5] H01L *39/12*; B05D *5/12, 1/18*

U.S. Cl. 505—1 8 Claims

1. An improved process for preparing a shaped article of a superconducting composition having the formula $MBa_2Cu_3O_x$ wherein

M is selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu;

x is from about 6.5 to about 7.0;

said composition having a superconducting transition temperature of about 90 K.;

said process consisting essentially of

(a) forming in acetic acid a mixture of $M(C_2H_3O_2)_3$, barium acetate and copper acetate in an atomic ratio of M:Ba:Cu of about 1:2:3;

(b) heating the resulting mixture to boiling, and adding sufficient formic acid to dissolve any undissolved starting material while continuing to boil the solution;

(c) contacting an article of cellulose material with the solution from step (b), thereby impregnating the article with the solution, said article having the shape desired;

(d) removing excess solution from the resulting impregnated article of cellulose material and drying the impregnated article;

(e) heating the impregnated article of cellulose material to a temperature from about 850° C. to about 925° C. in an oxygen-containing atmosphere for a time sufficient to form $MBa_2Cu_3O_y$, where y is from about 6.0 to about 6.4, said heating effecting carbonization of the cellulose material and oxidization of carbon without ignition; and

(f) maintaining the resulting article in an oxygen-containing atmosphere while cooling for a time sufficient to obtained the desired product.

4,983,574

COMPOSITE SUPERCONDUCTOR

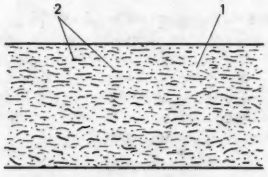
Gundolf Meyer, Birmenstorf, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Jul. 20, 1988, Ser. No. 221,519

Claims priority, application Switzerland, Jul. 28, 1987, 2881/87

Int. Cl.[5] H01B *12/00*

U.S. Cl. 505—1 6 Claims



1. A conductor with an electrical conductivity of at least $0.85 \times 10^6\ \Omega^{-1}\ cm^{-1}$ at 77 K composed of a composite material which is in turn composed of a non-superconducting metallic part and a superconducting part, wherein particles (2) of a ceramic sintered high-temperature superconductor of the type RE $Ba_2Cu_3O_{6.5-7.5}$, were RE = rare earth metal, are embedded in a matrix (1) composed of the non-superconducting metallic part, wherein the particles (2) of the ceramic sintered high-temperature superconductor are arranged rectilinearly in the current direction, and wherein the matrix (1) is composed of copper or silver and the high-temperature superconductor of $YBa_2Cu_3O_{6.5-7.5}$ and the mean particle diameter of the latter measures 0.1–100 μm.

4,983,575

SUPERCONDUCTING THIN FILMS MADE OF STACKED COMPOSITE OXIDE LAYERS

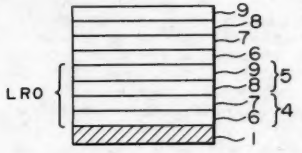
Matahiro Komuro, Hitachi; Yuzo Kozono, Hitachiota; Shinji Narishige, and Masanobu Hanazono, both of Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,498

Claims priority, application Japan, Mar. 25, 1987, 62-68884

Int. Cl.[5] H01L *39/22*

U.S. Cl. 505—001 3 Claims



1. A superconducting thin film comprising at least one layer of a Cu—O atomic pair film and a layer of an oxide film superposed on said Cu—O atomic pair film, and having a long range ordering and a uniform lattice strain, said oxide film being made of oxides of at least one element selected from the group consisting of Na, K, Be, Mg, Ca, Sr, Ba, Sc, Y, the lanthanide elements 57 to 71, Ti, Zr, V, Nb, In, Sn, Tl, Po, Ir, Bi and Pb, and a total thickness of said Cu—O atomic pair film and said oxide film being more than 11.3 Å but not greater than 1,000 Å.

4,983,576

SUPERCONDUCTING COMPOSITE WIRE AND CABLE, PROCESSOR FOR FABRICATING THEM

Sadaaki Hagino, Urawa; Motokazu Suzuki, Omiya; Shigeru Nishikawa, Omiya, and Kenichi Hayashi, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

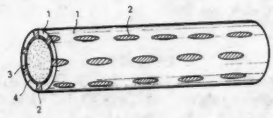
PCT No. PCT/JP88/01329, § 371 Date Aug. 24, 1989, § 102(e) Date Aug. 24, 1989, PCT Pub. No. WO89/06040, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 24, 1988, Ser. No. 408,502

Claims priority, application Japan, Dec. 24, 1987, 62-327747; Dec. 24, 1987, 62-327748

Int. Cl.[5] C04B *35/00*; H01B *13/00, 12/04*; B28B *1/00*

U.S. Cl. 505—1 4 Claims



2. A superconducting composite wire comprising

a composite pipe having an inner layer made of Ag material and an outer layer including

an Ag portion and

a non-Ag metal portion, the Ag portion of the outer layer being solid with the Ag material of the inner layer and exposed on the outer surface of the composite pipe, and

superconducting ceramics filled in the composite pipe.

4,983,577

METALORGANIC DEPOSITION OF SUPERCONDUCTING YB-BA-CU-O THIN FILMS BY RAPID THERMAL ANNEALING

Joseph V. Mantese, Washington; Adolph L. Micheli, Mt. Clemens, and Aboud H. Hamdi, Detroit, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1987, Ser. No. 136,585

Int. Cl.[5] B05D *5/12*

U.S. Cl. 505—1 **3 Claims**

1. A method for producing films of superconductor materials comprising the steps of:

forming a solution from the neodecanoates of ytterbium, barium, and copper metals, said metals form an oxide mixture exhibiting superconductive properties, said solution comprises a solvent having at least approximately 10 volume percent pyridine in xylene;

depositing a film of said solution onto a substrate, said substrate selected from the group consisting of strontium titanate, barium titanate, and sapphire;

pyrolyzing said film in an oxygen-containing environment at a first temperature of approximately 500° C. for up to approximately 5 minutes, so as to thermally decompose said neodecanoates of ytterbium, barium and copper into a film containing oxides of ytterbium, barium and copper, said pyrolyzing occurring substantially immediately after said depositing step; and

heating said oxide film at a second temperature ranging between about 850° C. and 1000° C. for a duration of up to approximately 2 minutes to promote grain growth of said metal oxides within said film and induce a change therein by which said film exhibits superconducting properties at a significantly increased temperature.

4,983,578

AIR FRESHENER COMPOSITION AND DEVICE

Donald Cashman; John A. Ferguson, and George B. Keyes, all of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Apr. 18, 1989, Ser. No. 339,345

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—3 **13 Claims**

1. An air freshener composition consisting essentially of:

(a) from about 2 to about 15 wt% of a phosphoric acid surfactant of the general formula

$$R(OCH_2CH_2)_xOPO_3H_2$$

wherein R is a nonylphenol moiety and x is an integer between about 3 and about 15,

(b) from about 0.1 to about 15 wt.% of diethylene glycol monoethylether,

(c) from about 3 to about 20 wt.% of at least one C_{2-12} alcohol solvent,

(d) from about 2 to 12 wt.% perfume,

(e) from about 0 to about 20 wt.% of other excipients, and

(f) q.s. 100 wt.% water,

wherein the ratio of the low volatile ingredient(s) to the non-volatile ingredient(s) is from about 1:0.13 to about 1:75.

4,983,579

CYANO-SUBSTITUTED SULFUR CONTAINING COMPOUNDS, COMPOSITIONS CONTAINING SAME, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

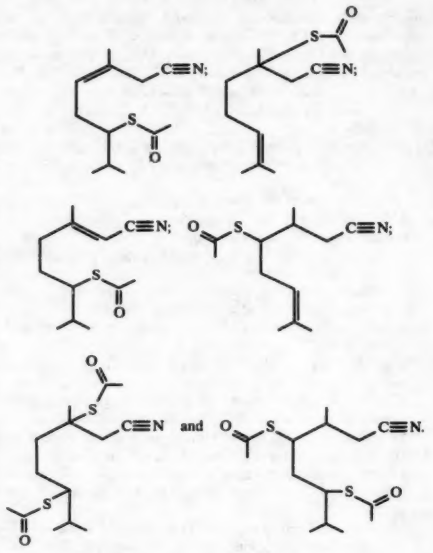
Richard M. Boden, Ocean, and Joseph A. McGhie, Orange, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 424,601, Oct. 20, 1989, which is a continuation-in-part of Ser. No. 273,016, Nov. 18, 1988, Pat. No. 4,883,884. This application Jun. 29, 1990, Ser. No. 545,841

Int. Cl.[5] C07C *255/17, 327/02*; A61K *7/46*

U.S. Cl. 512—6 **4 Claims**

1. A cyayno-substituted sulfur-containing compound defined according to a structure selected from the group consisting of:



3. A process for augmenting or enhancing the aroma or taste of a consumable material comprising the step of adding to said consumable material, an aroma or taste augmenting or enhancing quantity of the product defined according to claim 1.

4,983,580

METHODS AND MATERIALS FOR USE IN CORNEAL WOUND HEALING

David R. Gibson, Irvine, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 848,279, Apr. 4, 1986, abandoned. This application Mar. 7, 1990, Ser. No. 467,116

Int. Cl.[5] A01N *37/18, 43/04*; A61K *37/00, 37/715*

U.S. Cl. 514—2 **15 Claims**

1. A method for enhancing corneal healing following keratorefractive surgery in which incisions are made into the corneal stroma, the method comprising placing into the incisions a corneal mortar composition comprising at least one extracellular matrix material selected from the group consisting of fibronectin, collagen, vitronectin, elastin, laminin, actin, fibrinogen, chondroitin sulfate, heparin, keratin sulfate and hyaluronic acid and an ophthalmologically compatible carrier material, said composition having a sufficiently high viscosity to retain the extracellular matrix material within the incision under incision-healing conditions.

4,983,581

WOUND HEALING COMPOSITION OF IGF-I AND TGF-β

Harry N. Antoniades, Newton, and Samuel E. Lynch, Jamaica Plain, both of Mass., assignors to Institute of Molecular Biology, Inc., Boston and President and Fellows of Harvard College, Cambridge, both of, Mass.

Filed May 20, 1988, Ser. No. 196,975

Int. Cl.[5] A61K *37/36*

U.S. Cl. 514—12 **8 Claims**

1. A method for healing an external wound of a mammal

comprising applying to said wound a wound-healing amount of a composition consisting essentially or purified Insulin-like growth factor-1 and transforming growth factor beta.

4,983,582

PREVENTIVE AND THERAPEUTIC METHOD FOR HYPERTENSION

Masakazu Murata, Utsunomiya; Yoshinao Nagashima, Ichikai; Kenji Hara, Utsunomiya; Shigeto Kayane, and Takashi Imamura, both of Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,509

Claims priority, application Japan, Feb. 13, 1987, 62-31233

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—23 **14 Claims**

1. A method of inhibiting hypertension in a mammal, which comprises administering to said mammal an effective amount of a calcium salt of a hexose phosphate.

4,983,583

GRANULATED COMPOSITIONS OF POLYSACCHARIDES, PROCESS FOR THEIR PREPARATION AND USE

Claude Ridoux, Isle-sur-Sorgue, France, assignor to Sanofi, Societe Anonyme, Paris, France

Filed Oct. 21, 1988, Ser. No. 260,750

Claims priority, application France, Oct. 21, 1987, 87 14559

Int. Cl.[5] A61K *9/34, 9/36;* C07H *1/00*

U.S. Cl. 514—54 **9 Claims**

1. A powdered composition for dispersion in an aqueous solution to raise the viscosity of said solution, comprising granulated polysaccharide particles coated with hydrolysed gelatin, wherein said polysaccharide is selected from the group consisting of galactomannan, starch, natural or amidated pectin, xanthan, dextran, scleroglucan and mixtures thereof.

4,983,584

THERAPEUTIC AND PROPHYLACTIC AGENTS FOR PEPTIC ULCERS

Chikara Fukaya; Hitoshi Yasuda; Toshiaki Akira; Masakazu Iwai; Kanemichi Okano, and Kazumasa Yokoyama, all of Osaka, Japan, assignors to Green Cross Corporation, Osaka, Japan

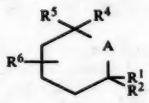
Filed Nov. 23, 1987, Ser. No. 124,139

Claims priority, application Japan, Nov. 22, 1986, 61-279181; Nov. 22, 1986, 61-279182; Nov. 22, 1986, 61-279183

Int. Cl.[5] A61K *31/00;* C07C *13/00*

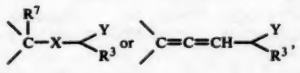
U.S. Cl. 514—54 **8 Claims**

5. A method for treating peptic ulcers in a mammal which comprises administering to the mammal a therapeutically and/or prophylactically effective amount of a cyclohexane derivative represented by general formula (I):



(I)

wherein A represents a group shown by formula, $>CH_2$,



wherein X represents ethynylene, vinylene or ethylene, Y represents oxo or a hydroxy group; R^1, R^4 and R^5 each represents an alkyl group; R^2 represents a hydrogen atom or a group shown by $—OR^8$; R^3 represents a hydrogen atom or an alkyl group;

R^6 represents a hydrogen atom, oxo or a group shown by $—OR^8$; and R^7 represents a hydrogen atom or a group shown by $—OR^8$, wherein R^8 represents a hydrogen atom or an organic residue.

8. The method for treating peptic ulcers of claim 5, wherein the organic residue is alkyl, acyl, alkoxycarbonyl, alkoxycarbonylalkyl, carboxyalkyl, carboxyalkylcarbonyl, cyclic acetal or an oligosaccharide residue having from 1 to 3 sugar units.

4,983,585

VISCOELASTIC FLUID FOR USE IN SURGERY AND OTHER THERAPIES AND METHOD OF USING SAME

Phillip E. Pennell, Denver, Colo.; John M. Blackmore, Redwood City, Calif., and Mark D. Allen, Lakewood, Colo., assignors to MDR Group, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 45,326, May 4, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 266,684

Int. Cl.[5] A61K *31/715, 47/00*

U.S. Cl. 514—57 **1 Claim**

1. A method of irrigating and protecting the corneal tissues during opthalmic surgery which comprises:

(a) covering the inner cornea with a physiologic saline solution comprising about 2% hydroxypropylmethyl cellulose and about 10 ppm polyethylene oxide.

(b) simultaneously wetting the outer cornea with a physiologic saline solution comprising about half the hydroxypropylmethyl cellulose and about twice the polyethylene oxide of the solution of step (a); and

(c) further, during the surgery, periodically wetting the outer cornea with the solution of step (b).

4,983,586

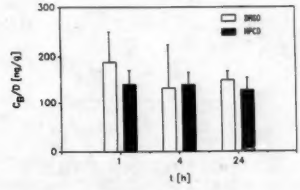
PHARMACEUTICAL FORMULATIONS FOR PARENTERAL USE

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 139,755, Dec. 30, 1987. This application Mar. 29, 1988, Ser. No. 174,945

Int. Cl.[5] A61K *9/18;* C08B *37/16*

U.S. Cl. 514—58 **41 Claims**



1. A method for decreasing the incidence of precipitation of a lipophilic and/or water-labile drug occurring at or near the injection site and/or in the lungs or other organs following parenteral administration, said method comprising parenterally administering said drug in an aqueous solution containing from about 20% to about 50% hydroxypropyl-β-cyclodextrin.

4,983,587

DIHYDRODIBENZOFURAN DERIVATIVES AND FUNGICIDES CONTAINING THESE COMPOUNDS

John-Bryan Speakman, Mannheim; Rudolf Karl, Limburgerhof; Gisela Lorenz, Neustadt; Eberhard Ammermann, Ludwigshafen; Bruno Wuerzer, Otterstadt; Norbert Meyer, Ladenburg, and Klaus Ditrich, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

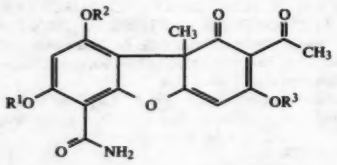
Filed Jul. 13, 1989, Ser. No. 379,198

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825840

Int. Cl.[5] C07D *307/91*

U.S. Cl. 514—63 7 Claims

1. Substituted benzofuran derivatives having fungicidal properties of the formula I



(I)

where R^1, R^2 and R^3 are identical or different and are each hydrogen, an alkali or alkaline earth metal, unsubstituted or substituted C_1–C_4-alkyl, unsubstituted or substituted aralkyl, C_2–C_4-alkanoyl, halogen-substituted C_2-alkanoyl, unsubstituted or substituted benzoyl or a radical $R^4R^5R^6Si$ in which R^4, R^5 and R^6 are identical or different and are each C_1–C_4-alkyl.

4,983,588

MITICIDAL AGENT

Kenji Tsuda, Himeji, Japan, assignor to Diacel Chemical Industries Ltd., Sakai, Japan

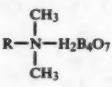
Filed Jan. 30, 1990, Ser. No. 472,163

Claims priority, application Japan, Feb. 1, 1989, 1-23408

Int. Cl.[5] A01N *55/08*

U.S. Cl. 514—64 1 Claim

1. A miticidal agent, comprising an miticidal effective amount of alkyldimethylamine tetraborate having the formula



wherein R is an alkyl group having 8 to 12 carbon atoms or the hydrate thereof; and

a carrier.

4,983,589

FUNGICIDAL IMIDAZOLE DIPHENYLALIPHATICBORANES AND DERIVATIVES THEREOF

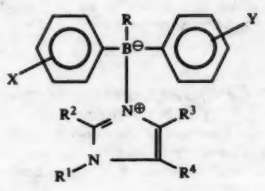
Tsze H. Tsang, El Cerrito; Vincent J. Spadafora, Benicia, and Patricia Pomidor, Orinda, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Dec. 14, 1989, Ser. No. 450,872

Int. Cl.[5] A01N *55/08*; C07F *5/02*

U.S. Cl. 514—64 65 Claims

1. A compound having the formula:



(I)

wherein:

R is alkyl having 1 through 4 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; alkenyl having 2 through 6 carbon atoms; haloalkyl having 1 through 4 halo substituents independently selected from the group of fluoro, chloro and bromo; or haloalkenyl having 3 through 6 carbon atoms and 1 through 4 halo atoms independently selected from the group of fluoro, chloro, and bromo;

R^1 is hydrogen; alkyl having 1 through 12 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; lower alkenyl having 2 through 6 carbon atoms; haloalkyl having 1 through 4 carbon atoms and 1 through 3 halo atoms independently selected from the group of fluoro, chloro, bromo, and iodo; haloalkenyl having 2 through 6 carbon atoms and 1 though 3 halo atoms independently selected from the group of fluoro, chloro, bromo, and iodo; cyanoalkyl wherein the alkyl moiety has 1 through 4 carbon atoms; hydroxyalkyl having 1 through 6 carbon atoms and 1 hydroxy group; lower alkoxyalkyl having 1 through 3 carbon atoms in the alkoxy moiety and 1 through 3 carbon atoms in the alkyl moiety; lower alkoxycarbonylalkyl having 1 through 3 carbon atoms in the alkoxy moiety and 1 through 3 carbon atoms in the alkyl moiety; phenyl; substituted phenyl having 1 through 4 substituents independently selected from the group of fluoro, chloro, bromo, iodo, lower alkyl having 1 through 6 carbon atoms and nitro with the proviso that said substituted phenyl has no more than two nitro substituents; aralkyl having 1 through 4 carbon atoms in the alkyl moiety and wherein the aryl moiety is phenyl; substituted benzyl having 1 through 4 substituents on the phenyl moiety independently selected from the group of fluoro, chloro, bromo, iodo, lower alkyl having 1 through 6 carbon atoms and nitro with the proviso the said phenyl moiety can have no more than 2 nitro substituents; and 1,3-dioxolan-2-yl-alkyl in which the alkyl moiety has 1 through 4 carbon atoms;

R^2 is hydrogen; lower alkyl having 1 through 6 carbon atoms; phenyl, benzyl, or substituted benzyl having 1 though 4 substituents on the phenyl ring independently selected from the group of fluoro, chloro, bromo, iodo and alkyl, having 1 through 6 carbon atoms;

R^3 is hydrogen or alkyl having 1 through 6 carbon atoms with the proviso that when R^4 is other than alkyl then R^3 is hydrogen;

R^4 is hydrogen, alkyl having 1 through 6 carbon atoms, phenyl, or phenalkyl in which the alkyl moiety has 1 through 4 carbon atoms; with the proviso that at least two of R^1, R^2, R^3 and R^4 are hydrogen and with the further proviso that when R^3 is alkyl, then R^4 is the identical parallel alkyl group; and

X and Y are independently hydrogen; alkyl having 1 through 4 carbon atoms; fluoro; chloro; alkoxy having 1 through 4 carbon atoms; alkylthio having 1 through 4 carbon atoms; or haloalkyl having 1 through 4 carbon atoms and 1 through 3 halo substituents independently selected from the group of fluoro, chloro, and bromo; and may be located at any available position of the respective phenyl rings.

61. A method for controlling fungi which comprises con-

tracting said fungi or its habitats with a fungicidally effective amount of a compound according to claim 1.

4,983,590

FUNGICIDAL TRIAZOLE BIS(TRIPHENYLBORANES), DERIVATIVES THEREOF AND USE THEREOF

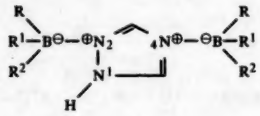
Tsze H. Tsang, El Cerrito, and Jon L. Strutzel, Fresno, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Mar. 12, 1990, Ser. No. 494,017

Int. Cl.[5] H01N *55/00*; **C07F** *5/02*

U.S. Cl. 514—64 **19 Claims**

1. A compound having the formula:



(I)

wherein:

R, RT[1], and R[2] are independently selected from the group of phenyl and substituted phenyl having 1 or 2 substituents independently selected from the group of fluoro, chloro, bromo and trifluoromethyl.

12. A method for controlling fungi which comprises contacting said fungi or its habitats with a fungicidally effective amount of a compound according to claim 1.

4,983,591

ENVIRONMENTALLY SAFE, BROAD SPECTRUM INSECTICIDE

George S. Puritch, Saanichton; Gregory S. Salloum, and Willem W. Nijholt, both of Victoria, all of Canada, assignors to Safer, Ltd., Scarborough, Canada

Continuation-in-part of Ser. No. 148,961, Jan. 27, 1988, Pat. No. 4,904,645. This application Nov. 6, 1989, Ser. No. 432,584

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] A01N *37/00, 43/54, 47/10, 57/00*

U.S. Cl. 514—65 **10 Claims**

1. A readily biodegradeable, environmentally safe, storage stabilized, aqueous, insecticidal solution for application to decorative and crop plants, said solution being effective to control plant damage from a wide range of chewing and sucking insects, said composition consisting essentially of:

an aqueous solution having a pH between about 7.5 and 8.8 and containing the following ingredients in the following relative parts by weight:

A. between 10 and 50 parts of a mixture of monocarboxylic acids and the alkali metal salts thereof, said monocarboxylic acids comprising at least 70 percent oleic acid and its alkali metal salts and at least 6 percent linoleic acid and its alkali metal salt;

B. between 0.05 and 5.6 parts of a pyrethrum extract comprising about 20 percent by weight of a mixture of insecticidally active substances selected from the group consisting of pyrethrin I and II, cinerin I and II, and jasmolin I and II;

C. between 3 and 225 parts of a low molecular weight alcohol; and

D. a trace amount of an antioxidant,

said composition being effective on application to a plant at a dilution in water such that the applied solution contains at least about 0.5 percent by weight of said monocarboxylic acid mixture and at least 0.005 percent by weight of said mixture of said insecticidally active pyrethrum extract substances to provide protection against plant damage from infestation by insect species from the orders Homoptera, Coleoptera, Dermaptera, Hemiptera, and Lepidoptera, and from crustacea species from the order Isopoda.

4,983,592

BIS-ARYLPHOSPHATE ESTER ANTAGONISTS OF PLATELET ACTIVATING FACTOR

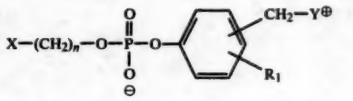
Allan Wissner, Ardsley; Kenneth Green, Yorktown Heights, both of N.Y., and Robert E. Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Co., Stamford, Conn.

Filed Dec. 19, 1988, Ser. No. 286,193

Int. Cl.[5] A61K *41/425, 41/415*

U.S. Cl. 514—92 **35 Claims**

1. A compound of the formula:



wherein:

X is a phenyl or napthyl ring optionally substituted in any position with one to five substituents on the phenyl group and one to seven substituents on the naphthyl group of;

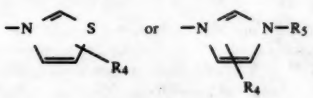
(i) —R_2, wherein R_2 is C_1–C_{25} alkyl, C_1–C_{25} alkenyl, C_1–C_{25} alkoxy, C_1–C_{25} thioalkyl, C_1–C_{25} alkenyloxy, phenyl, phenoxy, substituted phenyl or substituted phenoxy wherein the substituted are C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen or trifluoromethyl;

(ii) hydrogen, halogen, trifluoromethyl, cyano and nitro;

(iii) —CO_2R_3, —$CONHR_3$, —CHO, $OCONHR_3$, and —$NHCOR_3$ wherein R_3 is C_1–C_{25} alkyl, C_1–C_{25} alkenyl, phenyl or substituted phenyl wherein the substituents are C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen or trifluoromethyl;

R_1 is one or more substituents of the aromatic ring which may be in any position and are hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy or halogen;

—CH_2—Y is a single substituent of the aromatic ring which may occupy any position wherein Y is



wherein R_4 represents one or more substituents of the heterocyclic ring which may occupy a non-hetero atom position and is C_1–C_5 alkyl, C_1–C_5 alkoxy, hydrogen or halogen; the moiety R_5 is C_1–C_5 alkyl or hydrogen; and;

n is the integer 0 to 1.

4,983,593

PHARMACEUTICAL COMPOSITION OF DIHYDROPYRIDINE COMPOUND

Masaharu Miyajima; Yukiya Yamaguchi, both of Konan; Takao Tsunematsu, and Toshihisa Oda, both of Shiraoka, all of Japan, assignors to Zeria Pharmaceutical Co and Nissan Chemical Industries Ltd., both of Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,144

Claims priority, application Japan, May 30, 1988, 63-132262; Mar. 2, 1989, 1-50471

Int. Cl.[5] A61R *31/66*

U.S. Cl. 514—110 **4 Claims**

1. A pharmaceutical composition comprising (i) a 1:1 solvate of 5-(5,5-dimethyl-1,3,2-dioxaphosphorinane-2-yl)-1,4-dihydro-2,6-dimethyl-4-(3-nitrophenyl)-3-pyridine carboxylic acid 2-(phenyl(phenylmethyl)amino) ethyl ester P-oxide hydrochloride-ethanol and (ii) hydroxypropylmethylcellulose ace-

tate succinate, wherein (ii) is present in an amount of 1–7 parts by weight per unit weight (i).

4,983,594

PESTICIDAL THIONOPHOSPHORIC ACID AMINE ESTERS

Herbert Sommer, Remscheid; Dieter Arlt, Cologne; Jürgen Hartwig, Leverkusen; Bernhard Homeyer, Leverkusen, and Hans-Detlef Matthaei, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

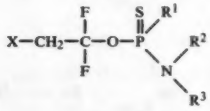
Filed Mar. 23, 1989, Ser. No. 327,490

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811006

Int. Cl.[5] A01N *9/36;* C07D *9/24*

U.S. Cl. 514—137 13 Claims

1. A thinonophosphoric acid amide ester of the formula



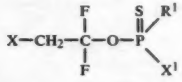
(I)

in which

R^1 stands for optionally substituted radicals from the group consisting of alkoxy, alkenyloxy and alkinyloxy, R^2 and R^3 are identical or different and independently of one another stand for optionally substituted radicals from the group consisting of alkyl, cycloalkyl, alkenyl and alkinyl, or one of them may stand for hydrogen, and

X stands for halogen.

12. An O-(1,1-difluoro-2-halogeno-ethyl) halogenothionophosphoric acid ester of the formula

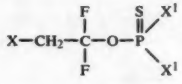


in which

R^1 stands for optionally substituted radicals from the group consisting of alkoxy, alkenyloxy and alkinyloxy, and

X and X^1 each independently stands for halogen.

13. An O-(1,1-difluoro-2-halogeno-ethyl) halogenothionophosphoric acid diester of the formula



in which

X and X^1 each independently stands for halogen.

4,983,595

AQUEOUS STEROID FORMULATIONS FOR NASAL ADMINISTRATION

Eric Benjamin, Dublin, Ohio; Shabbir Anik, Mountain View, and Ya-Yun T. Lin, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 866,171, May 22, 1986, Pat. No. 4,782,047. This application Sep. 20, 1988, Ser. No. 247,008

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[5] A61K *31/58*

U.S. Cl. 514—174 1 Claim

1. A stable, effectively preservable, substantially non-stinging aqueous anti-inflammatory steroid formulation suitable for intranasal administration, which formulation comprises:

Flunisolide (Hemihydrate)	0.0255% (w/v)
Propylene Glycol	5.0% (w/v)
PEG 400	20.0% (w/v)
Polysorbate 20	2.50% (w/v)
Benzalkonium Chloride (50%)	0.07% (w/v)
Edetate Disodium	0.01% (w/v)
Butylated Hydroxytoluene	0.01% (w/v)
Citric Acid (Anhydrous)	0.005% (w/v)
Trisodium Citrate Dihydrate	0.00765% (w/v)
Sorbitol (70%)	2.86% (w/v)
Purified Water, q.s. to	100.0 and
adjust pH to	5.3.

4,983,596

3-PYRROLIDINYLTHIO-1-AZABICYCLO[3.2.0]-HEPT-2-ENE-2-CARBOXYLIC ACID DERIVATIVES AND THEIR PREPARATION

Masayoshi Murata; Hideo Tsutsumi; Keiji Matsuda; Kohji Hattori, and Takashi Nakajima, all of Osaka, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

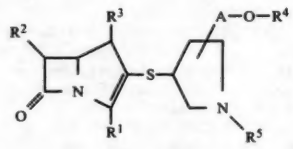
Filed May 4, 1989, Ser. No. 347,025

Claims priority, application United Kingdom, May 12, 1988, 8811237

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 10 Claims

1. A compound of the formula:



in which R^1 is carboxy or protected carboxy,

R^2 is hydroxy(lower)alkyl or protected hydroxy(lower)alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is 2-fluoroethyl, 2-chloroethyl, 2-fluoropropyl or 4-fluorobuty

R^5 is hydrogen, lower alkanimidoyl, unsubstituted lower cycloalkenyl or substituted by a group consisting of oxo and amino, or imino-protective group, and

A is lower alkylene, or pharmaceutically acceptable salts thereof.

4,983,597

BETA-LACTAMS AS ANTICHOLESTEROLEMIC AGENTS

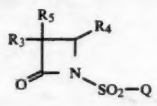
Shu S. Yang, Bridgewater; Yuan-Ching P. Chiang, Piscataway; James V. Heck, Scotch Plains, all of N.J., and Michael N. Chang, Newtown, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 31, 1989, Ser. No. 401,391

Int. Cl.[5] A61K *31/395;* C07D *401/12, 205/08, 403/12*

U.S. Cl. 514—210 19 Claims

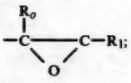
1. A compound of structural formula (I)



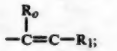
(I)

wherein:

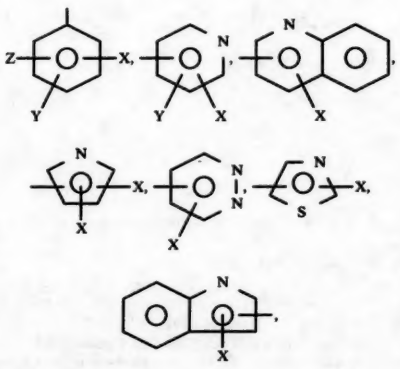
Q is
a. C_{1-5} alkyl,
b. C_{6-10} aryl or C_{6-10} heteroaryl including one heteroatom selected from N, O, or S;
c. C_{7-15} aralkyl or C_{7-15} heteroaralkyl;
d. C_{6-10} aryl or C_{6-10} heteroaryl substituted with W;
e. C_{7-15} aryl or C_{7-15} heteroaryl wherein the aryl or heteroaryl moiety is substituted with W wherein, in Q, the heteroaryl in hetereoaryl or heteroaralkyl consists of the rings given in the R_1 detinition, choice (b), except for the first of those rings, in which X, Y and M are given there;
R_3 and R_5 are independently selected from:
a. H,
b. C_{1-5} hydroxyalkyl,
c. C_{1-5} alkyl,
d. C_{1-5} alkoxy,
e. C_{2-6} alkenyl;
R_4 is CHR_oR;
R_o is H, C_{1-5} alkyl, phenyl or phenyl C_{1-5} alkyl; R is
a. $O\text{-}(CO)_{p2}\text{-}(A)_{p1}\text{-}R_1$,
b. OSO_2R_1,
c. AR_1,
d. R together with R_o and the C to which it is attached form



e. R together with R_o and the C to which it is attached form



p_1 and p_2 are independently 0 or 1; provided that p_2, and p2 are not both O;
R_1 is
a. H,
b. aryl, or a heteroaryl group of 5 to 10 atoms, including one to two heteroatoms, selected from:



c. phenyl $S(O)_n$-wherein n is 0 to 2,
d. C_{3-6} cycloalkyl;
M is O, N or S;
A is
a.

b.

c. NH;
R_2 is
a. H,
b. C_{1-5} alkoxy,
c. C_{1-5} alkyl,
d. OH,
e. $OC(O)CH_3$;
W is
a. C_{1-5} alkyl,
b. C_{1-5} alkoxy,
c. NO_2,
d. NHR_3,
e. halogen,
f. $COOR_3$,
g. $OCOR_3$,
h. $NHCOR_3$,
i. $NHSO_2R_3$,
j. $NHSO_2$phenyl;
X, Y, and Z are independently selected from:
a. H,
b. halogen,
c. C_{1-5} alkyl
d. Chd 1-5 alkoxy,
e. C_{1-5} alkoxycarbonyl
f. C_{1-5} alkylcarbonylamino,
g. amino,
h. phenoxy,
i. phenyl C_{1-5} alkoxy,
j. C_{1-5} alkylSO_2NH,
k. NO_2,
l. diphenylmethyloxycarbonyl,
m. C_{1-5} alkylthio,
n. aminocarbonyl,
o. carboxy.
p. C_{2-5}alkenyloxy
q. C_{1-5}alkylamido,
r. trifluoromethyl.

18. A hypocholesterolemic, hypolipidemic pharmaceutical composition comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound as defined in claim 1.

4,983,598

PHARMACEUTICAL COMPOSITION CONTAINING DILTIAZEM AND ANGIOTENSIN-CONVERTING ENZYME INHIBITOR

Icilio Cavero, Creteil; Francois Elkik, Paris; Peter Hicks, Cachan, and Jean-Claude Muller, Morsang S/Orge, all of France, assignors to Synthelabo, Paris, France

Continuation-in-part of Ser. No. 115,315, Nov. 2, 1987, abandoned. This application May 18, 1988, Ser. No. 195,151
Claims priority, application France, Nov. 20, 1986, 86 16138
Int. Cl.[5] A61K *31/40, 31/55*
U.S. Cl. 514—211 **2 Claims**

1. A pharmaceutical composition containing a combination of 10-360 mg of diltiazem and 1-100 mg of an angiotensin-converting enzyme inhibitor, enalapril useful for the treatment of hypertension, cardiac insufficiency, and coronary insufficiency, such that the anti-hypertensive effect observed upon combined administration of diltiazem and said angiotensin-converting enzyme inhibitor is greater than the sum of the individual anti-hypertensive effects observed upon the separate ad-

ministration of diltiazem and said angiotensin-converting enzyme inhibitor alone.

4,983,599

1-(4-AMINOPHENYL)-2-HEXAMETHYLENIMINO-PROPANONE, AND THEIR USE IN THERAPY

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Filed Feb. 9, 1989, Ser. No. 308,226

Claims priority, application France, Feb. 10, 1988, 8801565

Int. Cl.[5] A61K *31/55*; C07D *295/10, 295/12*

U.S. Cl. 514—212 **3 Claims**

1. A compound selected from the group consisting of 1-(4-aminophenyl)-2-hexamethyleniminopropanone and a pharmaceutically acceptable addition salt thereof.

3. A process for the stimulation of the immunological functions in a human in need thereof, comprising administering to aid human a compound selected from the group consisting of 1-(4-aminophenyl)-2-hexamethyleniminopropanone and a pharmaceutically acceptable addition salt thereof:

4,983,600

HETEROCYCLIC COMPOUNDS USEFUL AS 5-HT$_3$ ANTAGONISTS

Terence J. Ward, Maidenhead; Janet C. White, Wokingham, and Gerald Bradley, Weybridge, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 288,732, Dec. 22, 1988, abandoned. This application Oct. 16, 1989, Ser. No. 421,920

Claims priority, application United Kingdom, Dec. 24, 1987, 8730193; Aug. 19, 1988, 8819728

Int. Cl.[5] C07D *453/02*; A61K *31/475*

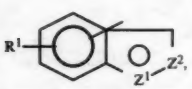
U.S. Cl. 514—214 **11 Claims**

11. A method for the treatment of migraine, emesis, anxiety, gastro-intestinal disorders or psychotic disorders which comprises administering to a warm blooded animal in need thereof, an effective amount of a heterocyclic compound of the formula

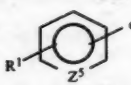
A—CONHCW—Y—B (I)

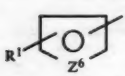
or a pharmaceutically acceptable acid addition salt thereof where

A represents an aromatic radical of the formula


(a)

(b)


or (c)


(d)

[where the free valence is attached to either fused ring of formula (a) or (b)]

R^1 represents hydrogen or one or more same or different substituents selected from lower alkyl, loweralkyloxy, cyclo(lower)alkyloxy, cyclo(lower)alkyl-loweralkyloxy, (lower)alkenyl(lower)alkyloxy, halo(lower)alkyloxy, hydroxy, halogen, halo(lower) alkyl, amino, nitro, carboxamido, phenyl(lower)alkyloxy (in which the phenyl group may be optionally substituted by one or more lower alkyl, loweralkyloxy or halo substituents), (lower)alkylamino, di(lower)alkylamino or acylamino

Z^1-Z^2 represents CH_2—CH, NR^2—CH, O—CH, S—CH, CH_2—N, O—N, S—N, NR^2—N, CH—NR^2 or N—NR^2, (where R^2 is hydrogen, (lower)alkyl or phenyl, or phenyl(lower) alkyl in which the phenyl groups may optionally be substituted by one or more lower alkyl, lower alkyloxy or halo substituents)

Z^3-Z^4 represents CH=CH, O—CH_2 or N=CH

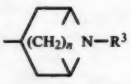
Z^5 represents N or CH

Z^6 represents O, S or NH

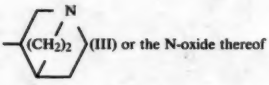
W represents oxygen or sulphur

Y represents NH or O

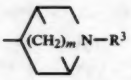
B represents a saturated azacyclic ring of the formula


(II)

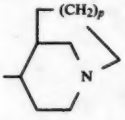
where n is 2, 3 or 4 and R^3 is hydrogen, or (lower)alkyl, or


(III) or the N-oxide thereof

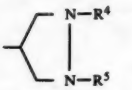
or


(IV)

where m is 1, 2 or 3 and R^3 has the meaning given above or


(V)

where p is 0, 1 or 2


(VI)

where R^4 is R^5 are each hydrogen or lower alkyl.

4,983,601

BENZO(B)PYRROLOBENZODIAZEPINES

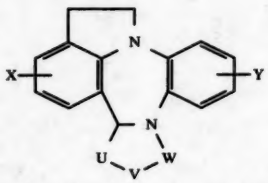
Edward J. Glamkowski, Warren, and Barbara E. Kurys, Elmwood Park, both of N.J., assignors to Hoechst-Roussel Pharmaceutical Inc., Somerville, N.J.

Filed Aug. 7, 1989, Ser. No. 390,130

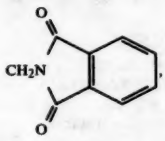
Int. Cl.[5] C07D *487/16*; A61K *31/55*

U.S. Cl. 514—219 **47 Claims**

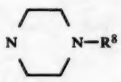
1. A compound of the formula



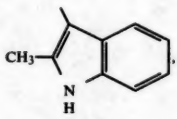
wherein U-V-W is -N-N=CR, NR^1-N=CR^2, -N-NR^3-C=O, -N-N=N, CH_2-NR^4-C=Z, or -N-CH=C-R^5 wherein R is hydrogen, loweralkyl, $CONH_2$, CH_2OH, CH_2Cl,



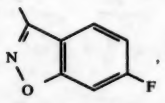
, or a group of the formula $(CH_2)_mNR^6R^7$ wherein R^6 and R^7 are independently hydrogen, loweralkyl, loweralkenyl, phenethyl, cycloalkylmethyl or cycloalkylcarbonyl;, and R^6 and R^7 taken together with the nitrogen atom to which they are attached form a group of the formula



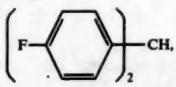
wherein R^8 is loweralkyl; R^1 and R^2 are phenyl; R^3 is hydrogen, cycloalkylmethyl, loweralkenyl, phenethyl, a group of the formula $(CH_2)_nR^9$ wherein R^9 is $NR^{10}R^{11}$ are independently loweralkyl, a group of the formula



, a group of the formula



or a group of the formula



, m and n are independently 1,2, or 3; R^4 is hydrogen or loweralkyl and Z is O or S; R^5 is loweralkyl; X and Y are independently hydrogen, loweralkyl, or halogen; the dotted line represents an optional carbon-to-carbon bond; an optical or geometrical isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,983,602

3'-HYDROXYBENZOXAZINORIFAMYCIN DERIVATIVE, PROCESS FOR PREPARING THE SAME AND ANTIBACTERIAL AGENT CONTAINING THE SAME

Takehiko Yamane, Akashi; Takuji Hashizume, Takasago; Katsuji Yamashita, Kobe; Kazunori Hosoe, Takasago; Fumiyuki Kuze, Kyoto, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

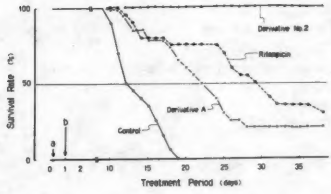
Filed Sep. 14, 1989, Ser. No. 407,995

Claims priority, application Japan, Nov. 1, 1988, 63-276661; Mar. 30, 1989, 1-80396

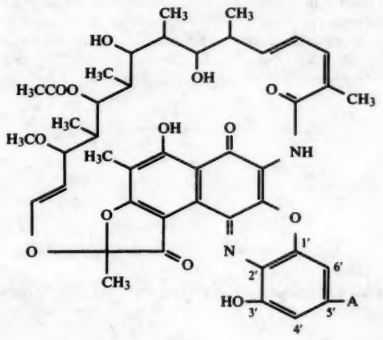
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[5] C07D *498/16*; A61K *31/535*

U.S. Cl. 514—229.5 **9 Claims**



1. A rifamycin derivative having the formula (I):

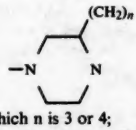


(I)

wherein A is a group having the formula:

in which

R^1 is an alkyl group having 4 or 5 carbon atoms or an alkenyl group having 3 to 5 carbon atoms, or a group having the formula:



in which n is 3 or 4;

or a pharmaceutically acceptable salt thereof.

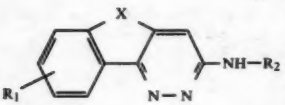
4,983,603

TRICYCLIC CHOLINERGIC RECEPTOR AGONISTS

Camille G. Wermuth, Strasbourg; Paul Worms, Gely du Fesc; Jean-Jacques Bourguignon, Hipsheim, and Roger Brodin, Montpellier, all of France, assignors to Societe Anonyme: SANOFI, Paris, France

Filed Dec. 23, 1988, Ser. No. 288,861
Claims priority, application France, Dec. 24, 1987, 87 18187
Int. Cl.[5] C07D *495/04, 491/05;* A61K *31/535, 31/50*
U.S. Cl. 514—232.8 4 Claims

1. A tricyclic compound having the formula

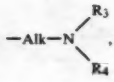

(I)

in which:

X represents an oxygen or sulfur atom or X represents —OCH_2— or —SCH_2—;

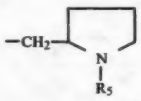
R_1 represents hydrogen or a halogen atom; and

R_2 represents:



in which:

Alk represents a linear or branched alkylene group having from 2 to 5 carbon atoms, and R_3 and R_4 each independently represent hydrogen or a lower alkyl group having 1 to 4 carbon atoms; or R_3 and R_4, with the nitrogen atom to which they are bonded, form a pyrrolidin-1-yl, piperidino, morpholino or piperazin-1-yl group; or



in which R_5 represents a lower alkyl group having 1 to 4 carbon atoms,

or a salt thereof with a pharmaceutically acceptable mineral or organic acid.

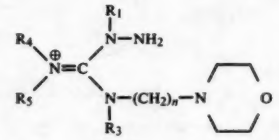
4,983,604

INHIBITORS OF NONENZYMATIC CROSS-LINKING

Peter C. Ulrich, New York, and Anthony Cerami, Shelter Island, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 119,958, Nov. 13, 1987, Pat. No. 4,908,446, which is a continuation-in-part of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984. This application Nov. 2, 1988, Ser. No. 264,930
Int. Cl.[5] A61K *31/535*
U.S. Cl. 514—238.5 15 Claims

1. The compounds of the formula



wherein R_1 is hydrogen or a lower alkyl group of 1–6 carbon atoms; a hydroxyethyl group; n is an integer of 2–7; R_3 is hydrogen, a lower alkyl group of 1–6 carbon atoms, R_4 is hydrogen, a lower alkyl group of 1–6 carbon atoms or an amino group; R_5 is hydrogen, or a lower alkyl group of 1–6 carbon atoms; with the provisio that at least one of R_1, R_3, R_4 or R_5 is other than hydrogen; and their pharmaceutically acceptable acid addition salts.

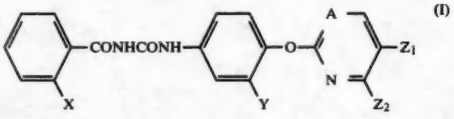
4,983,605

PHARMACEUTICAL COMPOSITION

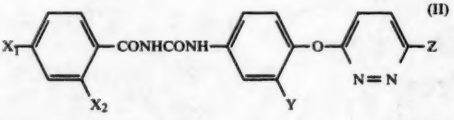
Nobuo Kondo, Daito; Masahiro Kikuchi, Mino; Tsunetaka Nakajima, Kashiwara; Masahiro Watanabe, Akashi; Kazumasa Yokoyama, Toyonaka; Takahiro Haga, Kusatsu; Nobutoshi Yamada; Hideo Sugi, both of Moriyama, and Toru Koyanagi, Kyoto, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd. and The Green Cross Corporation, both of Osaka, Japan

Continuation-in-part of Ser. No. 824,088, Jan. 30, 1986, Pat. No. 4,849,425. This application Oct. 20, 1987, Ser. No. 110,284
Claims priority, application Japan, Oct. 23, 1986, 61-253079; Jun. 30, 1987, 62-164497
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] A01N *43/58, 43/54, 47/28*
U.S. Cl. 514—247 10 Claims

1. A pharmaceutical composition consisting essentially of an antitumor benzoyl urea compound (A) selected from the group consisting of a benzoyl urea compound (I) having the formula:


(I)

wherein X is a halogen atom, a nitro group or a trifluoromethyl group, provided that when Y is a nitro group, X is a halogen atom or a nitro group, Y is a hydrogen atom, a halogen atom, a nitro group or a trifluoromethyl group, Z_1 is a halogen atom or a trifluoromethyl group, Z_2 is hydrogen atom on a halogen atom, and A is a —Ch— group or a nitrogen atom, and a benzoyl urea compound (II) having the formula:


(II)

wherein each of X_1 and X_2 is a hydrogen atom, a halogen atom or a nitro group, provided that when Y is a nitro group, X_1 is a hydrogen atom, Y is a hydrogen atom, a halogen atom, a nitro group or a trifluoromethyl group, and Z is a hydrogen atom, a halogen atom or a trifluoromethyl group, as an active ingredient; an effective amount of a nonionic surfactant as a dispersant; and an effective amount of at least one member selected from the group consisting of a cellulose, silicic anhydride, a sucrose fatty acid ester and polyoxyethylene polyoxy-

propylene glycol, as a distintegrator and wherein the ratio of the benzoyl urea compound (A):the dispersant:the distintegrator is 1 to 70:1 to 30:1 to 90 by weight.

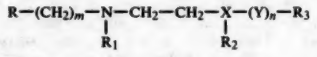
4,983,606

PHARMACEUTICALLY-ACTIVE PHTHALAZINE COMPOUNDS

Cesare Casagrande, Arese, and Francesco Santangelo, Milan, both of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Oct. 12, 1988, Ser. No. 256,560
Claims priority, application Italy, Oct. 12, 1987, 22218 A/87
Int. Cl.[5] C07D *237/32, 401/06, 403/06;* **A61K** *31/50*
U.S. Cl. 514—248 **7 Claims**

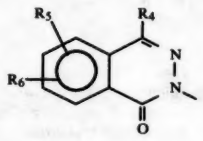
1. A compound of the formula



(I)

wherein

R is a 2-[1-oxo-(2H)-phthalazinyl] group formula



wherein

R_4 is hydrogen;

R_5 and R_6, equal to or different from one another, are hydrogen, halogen, nitro, C_1–C_4 alkyl or C_1–C_4 alkoxy;

R_1 and R_2, independently, are C_1–C_4 alkyl or together are —CH_2—CH_2— group;

X is nitrogen or —CH—;

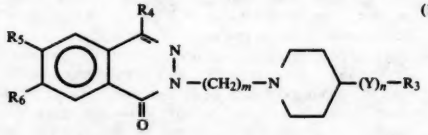
Y is selected from —CO— and —CHOH—.

R_3 is phenyl optionally substituted by one to three substituents selected from halogen, C_1–C_4 alkyl and C_1–C_4 alkoxy;

m is an integer from 1 to 4;

n is 1; and its salts with pharmaceutically acceptable acids.

2. A compound of the formula



(I-A)

wherein

R_4 is hydrogen or C_1–C_4 alkyl;

R_5 and R_6, equal to or different from one another, are hydrogen, halogen, nitro, C_1–C_4 alkyl or C_1–C_4 alkoxy;

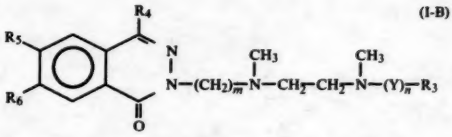
Y is selected from —CH_2, —CO—, —CHOH— and —NH—CO—.

R_3 is phenyl optionally substituted by one to three substituents selected from halogen, C_1–C_4 alkyl and C_1–C_4 alkoxy;

m is an integer from 1 to 4;

n is zero or 1.

3. A compound having the formula



(I-B)

wherein

R_4 is hydrogen or C_1–C_4 alkyl;

R_5 and R_6, equal to or different from one another, are hydrogen, halogen, nitro, C_1–C_4 alkyl or C_1–C_4 alkoxy;

Y is selected from —CH_2—, —CO—, —CHOH— and —NH—CO—.

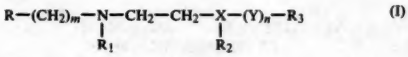
R_3 is a phenyl optionally substituted by one to three substituents selected from halogen, C_1–C_4 alkyl and C_1–C_4 alkoxy;

m is an integer from 1 to 4;

n is zero or 1; and its salts with pharmaceutically acceptable acids.

5. A pharmaceutical composition having anti-vasospastic, platelet anti-aggregating and tumor anti-proliterative properties comprising a therapeutically effective amount of a compound according to claim 2, and one or more pharmaceutically acceptable excipients.

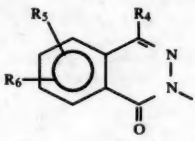
6. A compound of the formula



(I)

wherein

R is a 2-[1-oxo-(2H)-phthalazinyl] group of formula



wherein R_4 is hydrogen or C_1–C_4 alkyl,

R_5 and R_6, equal to or different from one another, are hydrogen, halogen, nitro, C_1–C_4 alkyl or C_1–C_4 alkoxy; R_1 and R_2, independently, are C_1–C_4 alkyl or together are —CH_2—CH_2— group;

X is nitrogen or —CH—;

Y is selected from —CH_2—, —CO—, —CHOH— and —NH—CO—.

R_3 is fluorophenyl;

m is 2 or 3;

n is zero or 1;

and its salts with pharmaceutical acceptable acids.

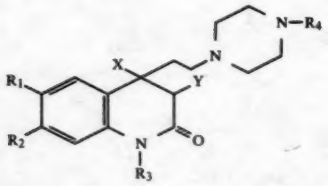
4,983,607

QUINOLINONE DERIVATIVES AND THEIR PREPARATION IN THERAPY

Philippe Manoury, Verrieres Le Buisson; Daniel Obitz, Antony; Michel Peynot, L'Hay Les Roses, and Jonathan Frost, Wissous, all of France, assignors to Synthelabo, Paris, France

Filed Oct. 10, 1989, Ser. No. 417,970
Claims priority, application France, Oct. 11, 1988, 88 13324
Int. Cl.[5] A61K *31/495;* **C07D** *401/06, 401/14*
U.S. Cl. 514—253 **8 Claims**

1. A quinolinone derivative which is a compound of formula (I):



in which

R_1 and R_2 are each, independently of one another, a hydrogen or halogen atom or a (C_{1-4})alkyl radical;

R_3 is a hydrogen atom or a (C_{1-4})alkyl radical;

R_4 is an unsubstituted or substituted naphthyl, tetrahydronaphthyl, benzyl, phenyl, pyridyl, isoquinolyl or benzoyl radical; and

X and Y are each a hydrogen atom or together form a bond; or a pharmaceutically acceptable acid addition salt thereof and, when X and Y are each a hydrogen atom, the diastereoisomers and enantiomers thereof.

8. A pharmaceutical composition which comprises a pharmaceutically effective amount of a derivative as defined in claim **1** and a pharmaceutically acceptable excipient.

4,983,608

N-SUBSTITUTED-4-PYRIMIDINAMINES AND PYRIMIDINEDIAMINES

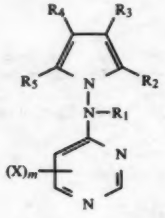
Richard C. Effland; Joseph T. Klein, both of Bridgewater; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussell Pharmaceuticlas, Inc., Somerville, N.J.

Filed Sep. 5, 1989, Ser. No. 402,415

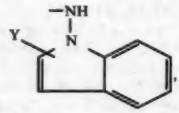
Int. Cl.[5] **C07D** *403/12, 403/14;* **A61K** *31/505*

U.S. Cl. 514—256 **77 Claims**

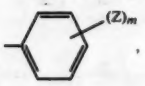
51. A pain alleviating composition which comprises an effective pain alleviating amount of a compound of the formula



where R_1 is hydrogen, loweralkyl, aryl, or arylloweralkyl; R_2 and R_3 are independently hydrogen or loweralkyl, or R_2 and R_3 taken together are aryl; R_4 and R_5 are independently hydrogen or loweralkyl, or R_4 and R_5 taken together are aryl; X is hydrogen, halogen, cyano, nitro, amino, loweralkyl, loweralkoxy, trifluoromethyl or



where Y is hydrogen, halogen or loweralkyl; m is an integer of 1 to 3; the term "aryl" in each occurrence signifying a compound of the formula



where Z is hydrogen, halogen, loweralkyl, loweralkoxy, trifluoromethyl, nitro and amino and m is an integer of 1 to 3; and the pharmaceutically acceptable acid addition salts thereof and where applicable the geometrical and optical isomers and racemic mixtures thereof and a suitable carrier therefor.

4,983,609

5-FLUOROURACIL DERIVATIVES

Setsuro Fujii, Kyoto, Japan, assignor to Otsuka Pharmaceutical, Osaka, Japan

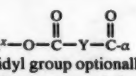
Division of Ser. No. 903,824, Sep. 3, 1986, Pat. No. 4,864,021, and a continuation-in-part of Ser. No. 793,056, Oct. 30, 1985, abandoned. This application Jul. 15, 1988, Ser. No. 219,521

Claims priority, application Japan, Oct. 30, 1984, 59-229938; Nov. 30, 1984, 59-259587; Jan. 17, 1985, 60-7190; Mar. 25, 1985, 60-59788; May 9, 1985, 60-98295; Aug. 30, 1985, 60-192582; Sep. 3, 1985, 60-195223; Jul. 25, 1986, 61-176464; Jul. 30, 1986, 61-181027

Int. Cl.[5] **A61K** *31/505;* **C07D** *239/10*

U.S. Cl. 514—274 **15 Claims**

1. A compound represented by the formula



(Ib)

wherein R^x is a pyridyl group optionally having 1 to 4 substituents selected from the group consisting of hydroxy group, oxo group, halogen atom, amino group, carboxyl group, cyano group, nitro group, carbamoyl group, lower alkylcarbamoyl group, carboxy-lower alkylcarbamoyl group, lower alkoxycarbonyl-lower alkylcarbamoyl grup, phenyl-carbamoyl optionally substituted with 1 to 3 substituents selected from the group consisting of halogen atom, lower alkoxy group and lower alkyl group on the phenyl ring, lower alkyl group, lower alkenyl group, lower alkoxycarbonyl group, tetrahydrofuranyl group, tetrahydropyranyl group, lower alkoxylower alkyl group, lower alkylthio-lower alkyl group, phenyl-lower alkoxy-lower alkyl group, phthalidyl group and acyloxy group, and Y is an arylene group selected from the group consisting of phenylene, naphthalene, pyridinediyl, pyrazinediyl, furandiyl and 4-pyridon-1-lower alkyl-diyl; and wherein the acyl moiety of the acyloxy group is selected from the group consisting of:

(i) C_1–C_{20} alkenoyl groups optionally substituted with a substituent selected from the group consisting of halogen atom, hydroxy group, lower alkoxy group, aryloxy group, substituted or unsubstituted aryl group, phenyl-lower alkoxycarbonyl group and lower alkylcarbamoyl group,

(ii) arylcarbonyl groups optionally substituted with lower alkylenedioxy group or with 1 to 3 substituents selected from the group consisting of halogen atom, lower alkyl group, lower alkoxy group, carboxy group, lower alkoxycarbonyl group, nitro group, cyano group, phenyl-lower alkoxycarbonyl group, hydroxy group, guanidyl group, phenyl-lower alkoxy group, amino group and amino group substituted with lower alkyl group,

(iii) thenylcarbonyl, furanylcarbonyl, thiazolycarbonyl, quinolylcarbonyl, pyrazinylcarbonyl, pyridylcarbonyl,

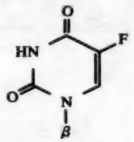
(iv) aryloxycarbonyl groups or straight or branched-chain or cyclic alkoxycarbonyl groups,

(v) (C_3–C_8 cycloalkyl) carbonyl groups optionally substituted with halogen, hydroxy, lower alkoxy or lower alkyl,

(vi) lower alkenyl or lower alkynyl carbonyl groups, and

(vii) lower alkenyl or lower alkynyl oxycarbonyl groups; and α is a group which is formed from a 5-fluorouracil derivative linked by an amide linkage to the carbonyl

group to which it is attached, and which is represented by the formula


(1-1a)

wherein β represents hydrogen atom, tetrahydrofuranyl, lower alkylcarbamoyl, phthalidyl, lower alkoxy-lower alkyl or lower alkanoyloxy-lower alkoxycarbonyl group.

4,983,610

PYRIMIDINE CARBOXYLIC ACIDS AND ESTERS

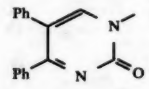
Nicholas A. Meanwell, East Hampton, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Feb. 13, 1990, Ser. No. 479,561
Int. Cl.[5] A61K *31/505*; C07D *239/36*
U.S. Cl. 574—274 **7 Claims**

1. A compound of Formula I

$$HET_1—(CH_2)_nCO_2R \quad (I)$$

wherein
n is 6 to 9;
R is hydrogen or lower alkyl or an alkali metal ion; and
HET_1 is the heterocyclic radical



1-oxo-4,5-diphenyl-2H-pyrimidin-1-yl.

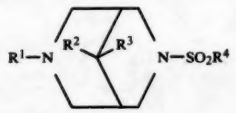
4,983,611

3-SULFONYL-3,7-DIAZABICYCLO[3,3,1]NONANE INTERMEDIATES AND PHARMACEUTICAL METHOD

Uwe Schön, Burgdorf; Wolfgang Kehrbach, Hannover, and Klaus-Ullrich Wolf, Uetze-Hänigsen, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hannover, Fed. Rep. of Germany

Division of Ser. No. 214,032, Jun. 30, 1988, Pat. No. 4,906,640.
This application Sep. 25, 1989, Ser. No. 401,749
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722134
Int. Cl.[5] A61K *31/44*; C07D *471/08*
U.S. Cl. 514—300 **5 Claims**

2. A method of treating a stomach motility disturbance in a mammal comprising the step of ingesting into the stomach of said mammal an effective stomach motility improving amount of a 3-sulfonyl-3,7-diazabicyclo[3,3,1]nonane compound corresponding to the Formula I,


(I)

wherein
R^1 is an alkyl group with 1–6 carbon atoms, a cycloalkylalkyl group with 4–7 carbon atoms or benzyl,
R^2 is hydrogen or lower alkyl and
R^3 is hydrogen or lower alkyl or
R^2 and R^3 together form an alkylene chain with 3–6 carbon atoms, and
R^4 represents lower alkyl, thienyl, halogen substituted thienyl, or a $—(CH_2)_n-R^5$ group, wherein n=0–3 and
R^5 is a phenyl group or a phenyl group substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl or nitro,
or a pharmaceutically acceptable acid addition salt thereof.

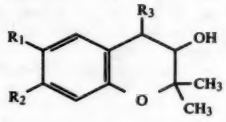
4,983,612

ANTIHYPERTENSIVE BENZOPYRAN DERIVATIVES

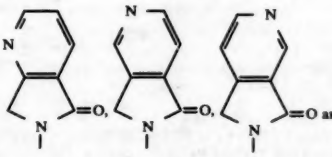
Dominick Quagliato, Edison, and David D. Deininger, New Brunswick, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

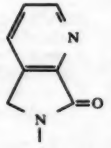
Filed Oct. 5, 1989, Ser. No. 417,350
Int. Cl.[5] C07D *491/02*; A61K *31/44*
U.S. Cl. 513—300 **8 Claims**

1. A compound of formula (I)


(I)

wherein R_1 and R_2 are independently selected from the group consisting of H, halogen, F, C_1 to C_7 alkyl, C_3 to C_7 cycloalkyl, cyano, nitro, trifluoromethyl, trifluoromethoxy, trifluoroethoxy, C_1 to C_7 alkoxy, C_1 to C_7 alkylcarbonyl, C_3 to C_7 cycloalkylcarbonyl, C_1 to C_7 thio alkyl, C_1 to C_7 sulfoxyl alkyl, C_1 to C_7 sulfonyl alkyl, amino, C_1 to C_7 mono-or disubstituted amino, C_1 to C_7 mono- or disubstituted amido; R_3 is selected from the group consisting of





and the N-oxides and the N-oxides and pharmaceutically acceptable salts thereof.

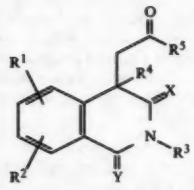
4,983,613

ISOQUINOLINE ACETIC ACIDS AND ACETYL CARBAMATES USEFUL AS ALDOSE REDUCTASE INHIBITORS

Michael S. Malamas, Jamison, Pa., assignor to American Home Products Corporation, New York, N.Y.

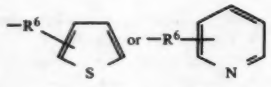
Filed Apr. 21, 1989, Ser. No. 341,608
Int. Cl.[5] A61K *31/47*; C07D *401/06*
U.S. Cl. 514—309 **11 Claims**

11. A method of treatment of neuropathy, nephropathy, retinopathy, or cataracts in a diabetic mammal, which comprises administering to said mammal an effective amount of a compound of formula (I)



(I)

wherein R^1 and R^2 are independently hydrogen, alkyl consisting of 1 to 6 carbon atoms, halogen, lower alkoxy consisting of 1 to 6 carbon atoms, trifluoromethyl, lower alkylthio wherein lower alkyl consists of 1 to 6 carbon atoms, dialkylamino wherein alkyl consists of 1 to 6 carbon atoms, nitro, aryl or aryl(lower alkyl) oxy wherein aryl consists of 6 to 10 carbon atoms and lower alkyl consists of 1 to 6 carbon atoms; R^3 is lower alkyl consisting of 1 to 6 carbon atoms, aryl, aryl(lower alkyl) or halogen substituted aryl(lower alkyl) wherein aryl consists of 6 to 10 carbon atoms and lower alkyl consists of 1 to 6 carbon atoms, acyl or heterocyclic (lower alkyl) of structural formula



wherein R^6 is lower alkylene consisting of 1 to 3 carbon atoms; R^4 is hydrogen, lower alkyl consisting of 1 to 6 carbon atoms, carboalkoxy wherein alkoxy consists of 1 to 3 carbon atoms; R^5 is amino, hydroxy, alkoxy consisting of 1 to 6 carbon atoms, lower alkyl carbamates wherein lower alkyl consists of 1 to 6 carbon atoms, aryl carbamates wherein aryl consists of 6 to 10 carbon atoms, and aryl(lower alkyl) carbamates wherein lower alkyl consists of 1 to 6 carbon atoms; X and Y are oxygen or sulfur, or the pharmaceutically acceptable salts thereof.

4,983,614

BENZHYDRYLOXYETHYLPIPERIDINE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS, IN WHICH THEY ARE PRESENT

André Buzas, Bievres; Jean-Yves Merour, and Roland Ollivier, both of Olivet, all of France, assignors to Les Laboratoires Meram, Paris, France

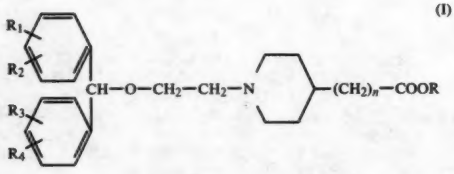
Continuation of Ser. No. 92,072, Sep. 2, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 291,189

Claims priority, application France, Sep. 5, 1986, 86 12508

Int. Cl.[5] A61K *31/445*

U.S. Cl. 514—317 **7 Claims**

1. Benzhydryloxyethylpiperidine derivatives corresponding to the following formula:



(I)

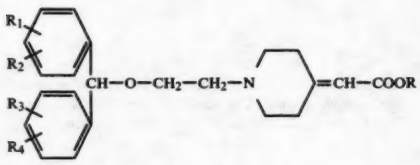
in which:

R_1, R_2, R_3, and R_4, which are identical or different, represent a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryloxy group or the trifluoromethyl group,

R represents hydrogen, a cation, an alkyl group, an aryl group or an arylalkyl group, and

n is equal to 0 or 1, and their pharmaceutically acceptable salts.

4. Benzhydryloxyethylpiperidine derivatives corresponding to the following formula:



(II)

in which:

—R_1, R_2, R_3, and R_4, which are identical or different, represent a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryloxy group or the trifluoromethyl group,

—R represents hydrogen, a cation, an alkyl group, an aryl group or an arylalkyl group, and

their pharmaceutically acceptable salts.

4,983,615

HETEROARYLAMINO-AND HETEROARYLOXYPYRIDINAMINE COMPOUNDS WHICH ARE USEFUL IN TREATING SKIN DISORDERS

Richard C. Effland; Joseph T. Klein, both of Bridgewater; Gordon E. Olsen, Somerset; Larry Davis, Sergeantsville; Russell R. L. Hamer, Lebanon, and Brian S. Freed, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

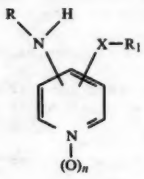
Continuation-in-part of Ser. No. 372,509, Jun. 28, 1989. This application Mar. 21, 1990, Ser. No. 496,723

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.[5] C07D *213/89*; A61K *31/44*

U.S. Cl. 514—337 **30 Claims**

1. A compound having the formula,

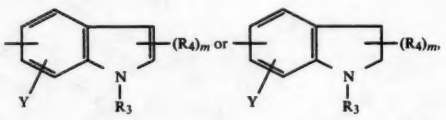


where

n is 0 or 1;

X is O or NR_2, R_2 being hydrogen, loweralkyl or loweralkylcarbonyl;

R is hydrogen, loweralkyl, arylloweralkyl or loweralkylcarbonyl; and R_1 is



wherein R_3 is hydrogen, loweralkyl or loweralkylcarbonyl; m is 1 or 2; each R_4 is independently hydrogen or loweralkyl; and Y is hydrogen, halogen, loweralkyl, loweralkoxy or trifluoromethyl; the term aryl in each occur-

rence signifying a phenyl group optionally mono-substituted with a loweralkyl, loweralkoxy, halogen or trifluoromethyl group; or a pharmaceutically acceptable acid addition salt thereof.

29. A method of treating a patient in need of relief from a skin disorder which comprises administering to such a patient an effective amount of a compound as defined in claim 1.

4,983,616

HEXAHYDROPYRROLO(2,3-B)INDOLE CARBAMATES, UREAS, AMIDES AND RELATED COMPOUNDS

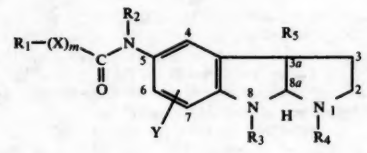
Gerard J. O'Malley, Newtown, Pa.; Richard C. Allen, Flemington, N.J., and John I. White, Harleysville, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Feb. 1, 1990, Ser. No. 480,706

Int. Cl.[5] A61K *31/44, 31/41;* C07D *401/14, 487/06*

U.S. Cl. 514—339 36 Claims

1. A compound of the formula,



where

X is O, S, NH, N-loweralkyl, or N-arylloweralkyl;

Y is hydrogen, fluorine, chlorine, bromine, nitro, loweralkyl, loweralkoxy or triloweralkylsilyl;

R_1 is loweralkyl, halogen-substituted loweralkyl, aryl, arylloweralkyl, cycloalkyl, heteroaryl or heteroarylloweralkyl;

R_2 is hydrogen, loweralkyl or arylloweralkyl;

R_3 is loweralkyl or arylloweralkyl;

R_4 is hydrogen, loweralkyl, loweralkenyl, loweralkynyl, arylloweralkyl, formyl, loweralkylcarbonyl, arylloweralkylcarbonyl or loweralkoxycarbonyl;

R_5 is hydrogen or loweralkyl; and

m is 0 or 1, with the proviso that when m is 0, R_1 may also be hydrogen,

the term heteroaryl in each occurrence signifying a group depicted by the formula,

where R_6 is hydrogen or loweralkyl;

or a pharmaceutically acceptable acid addition salt thereof.

36. A method of treating a patient in need of relief from a memory dysfunction characterized by a cholinergic deficit which comprises administering to such a patient an effective amount of a compound as defined in claim 1.

4,983,617

STABLE CRYSTAL FORM OF 1,4-DIHYDRO-2-(IMIDAZOLYL-1-YLMETHYL)-6-METHYL-4-(3-NITROPHENYL)PYRIDINE-3,5-DICARBOXYLIC ACID 3-ETHYL 5-METHYL DIESTER, HYDROCHLORIDE

Gerald Bradley, Weybridge; Geoffrey P. R. Carr, High Wycombe; Albert Opalko, Maidenhead, and Richard J. Yarwood, Buckland, all of England, assignors to John Wyeth and Brothers Limited, Maidenhead, England

Filed Dec. 12, 1988, Ser. No. 283,352

Claims priority, application United Kingdom, Dec. 17, 1987, 8729471

Int. Cl.[5] C07D *403/06;* A61K *31/44*

U.S. Cl. 514—341 2 Claims

1. Anhydrous, crystalline 1,4-dihydro-2-(imidazol-1-ylmethyl)- 6-methyl-4-(3-nitrophenyl)pyridine-3,5-dicarboxylic acid 3-ethyl 5-methyl diester hydrochloride in substantially pure form having a melting point greater than about 215° C., an infra red spectrum (nujolmull) having sharp peaks at 3195 cm^{-1}, 3100 cm^{-1}, 2735 cm^{-1} and 2625 cm^{-1} and an X ray powder diffraction pattern with specific peaks occuring at $2\theta = 12.3°$ and 44.5°.

4,983,618

COMBINATION OF 2-(THIOCYANOMETHYLTHIO)BENZOTHIAZOLE AND A TRIHALOGENATED PHENOL

Miguel L. Pulido, Memphis, Tenn., and Juan M. Ayzaguer, Santiago, Chile, assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Jul. 14, 1989, Ser. No. 380,117

Int. Cl.[5] A01N *31/08, 43/78*

U.S. Cl. 514—367 23 Claims

1. A composition for controlling microbiological growth comprising a synergistically effective microbiocidal amount of the combination of 2-(thiocyanomethylthio) benzothiazole and tribromophenol.

4,983,619

PHARMACEUTICAL COMPOUNDS

Peter T. Gallagher, Yateley, and Terence A. Hicks, Fleet, both of England, assignors to Lilly Industries Limited, Basingstoke, England

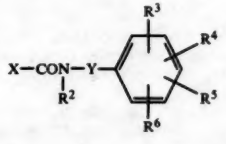
Continuation of Ser. No. 372,148, Jun. 26, 1989, abandoned, which is a continuation of Ser. No. 83,531, Aug. 7, 1987, abandoned. This application Jan. 11, 1990, Ser. No. 464,644

Claims priority, application United Kingdom, Aug. 8, 1986, 8619433

Int. Cl.[5] A61K *31/425, 31/40;* C07D *333/36, 307/02*

U.S. Cl. 514—371 8 Claims

1. A compound of the formula



in which X is $R^1(HO)C{=}C(CN)$—or $R^1(CO)$—$CH(CN)$—, R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4, R^5 and R^6 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, optionally substituted phenyl, optionally substituted phenoxy, R'R"N—where R' and R" are each hydrogen or C_{1-4} alkyl or R'R"CONH—where R' and R" is C_{1-4} alkyl, or a group of the formula $—CR^7R^8R^9$ in which R^7, R^8 and R^9 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl or

optionally substituted phenyl, or R^7 and R^8, together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms, and Y is a thiophene, furan, pyrrole, or thiazole ring optionally substituted with one or two C_1–C_4 alkyl groups; and salts thereof.

4,983,620

PHARMACOLOGICALLY ACTIVE ALKYLTHIOBENZIMIDAZOLE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Roberto P. Giani, Locate Triulzi; Ettore Parini, Cologno Monzese, and Giancarlo Tonon, Milan, all of Italy, assignors to Dompé Farmaceutici S.p.A., Milan, Italy

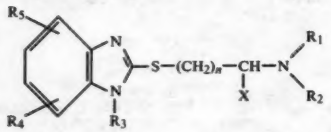
Filed Mar. 22, 1989, Ser. No. 327,094

Claims priority, application Italy, Mar. 25, 1988, 19958 A/88

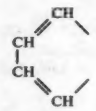
Int. Cl.[5] A61K *31/415, 31/535;* **C07D** *235/28, 413/12*

U.S. Cl. 514—395 **8 Claims**

1. An alkylthiobenzimidazole derivative having the structural formula:



wherein R_1 and R_2 each represent 1–3 carbon alkyl or they may form together with the adjacent nitrogen, an optionally substituted heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, piperazine and morpholine; X represents hydrogen or methyl; n is 1 or 2; R_3 represents 4–6 carbon alkoxyalkyl, or 5 or 6 carbon cycloalkyl ; and R_4 and R_5 may be the same or different and each represent hydrogen or 1 or 2 carbon alkyl or they, attached at the positions 5 and 6 of the benzimidazole nucleus, may form together the ring



or a pharmaceutically acceptable, suitable acid addition salt thereof.

5. An antihistamine and/or anti allergic composition which comprises an antihistaminically and/or antiallergically effective amount of a compound of claim 1 in an admixture with a suitable pharmaceutically acceptable diluent.

4,983,621

MEDICAMENTS

Keith T. Bunce, Luton, and Patrick P. A. Humphrey, Bedford, both of England, assignors to Glaxo Group Limited, London, England

Filed Jul. 6, 1989, Ser. No. 375,913

Claims priority, application United Kingdom, Jul. 7, 1988, 8816187

Int. Cl.[5] A61K *31/415*

U.S. Cl. 514—397 **22 Claims**

1. A pharmaceutical composition for use in human or veterinary medicine for the treatment and/or prevention of nausea and vomiting comprising an effective amount of 1,2,3,9-tetrahydro-9-methyl-3-[(2-methyl-1H-imidazol-1-yl)methyl]-4H-carbazol-4-one or a physiologically acceptable salt or solvate thereof, and an effective amount of a cyclo-oxygenase inhibitor, selected from the group consisting of piroxicam, mefenamic acid, and flufenamic acid.

4,983,622

6-SUBSTITUTED-4-DIALKYLAMINOTETRAHYDROBENZ(C,D)INDOLES

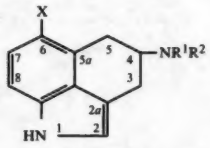
Michael E. Flaugh, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 577,096, Feb. 6, 1984, abandoned. This application Feb. 1, 1985, Ser. No. 697,310

Int. Cl.[5] A61K *31/40;* **C07D** *209/90*

U.S. Cl. 514—411 **15 Claims**

1. A 4-substitutedamino-6-substituted-1,3,4,5-tetrahydrobenz[c,d]indoles of the formula



wherein R^1 and R^2 are individually hydrogen, methyl, ethyl, n-propyl or allyl, and X is OC_{1-3} alkyl, O-benzyl, or O-acyl or OH; wherein acyl is a member of the group benzoyl, naphthoyl, mono-or di-substituted benzenesulfonyl where said substituents are members of the group methyl, halo or C_{1-2} alkoxy, C_{1-3} alkyl CO, C_{1-3} alkyl SO_2, C_{3-7} cycloalkylcarbonyl, cyclobutylsulfonyl, methylenedioxybenzoyl or anisoyl; and pharmaceutically acceptable salts thereof.

4,983,623

DERIVATIVES OF CYCLIC AMINO ACIDS, AGENTS CONTAINING THEM, AND THE USE THEREOF

Rainer Henning, Hattersheim am Main; Hansjörg Urbach, Kronberg/Taunus, and Franz Hock, Dieburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

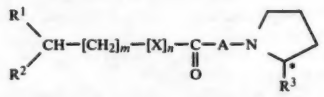
Filed Dec. 13, 1988, Ser. No. 283,693

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742431

Int. Cl.[5] A61K *31/40;* **C07D** *403/06*

U.S. Cl. 514—414 **6 Claims**

1. A compound of the formula I



(I)

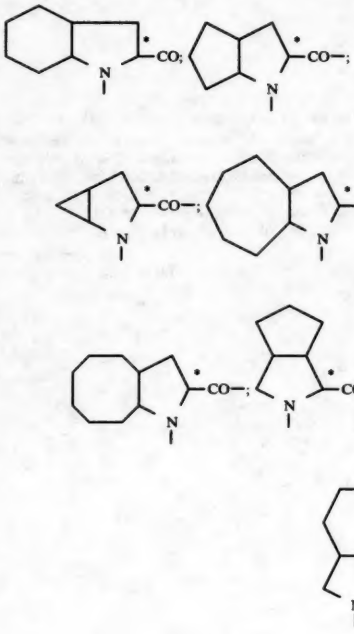
in which

R^1 denotes hydrogen; (C_1–C_{20})-alkyl; (C_3–C_{20})-alkenyl; (C_6–C_{12})-aryl which is optionally substituted by one, two or three identical or different radicals selected from (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen, nitro, hydroxyl, amino, (C_1–C_4)-alkylamino and di-(C_1–C_4)-alkylamino, or one (C_1 or C_2)-alkylenedioxy;

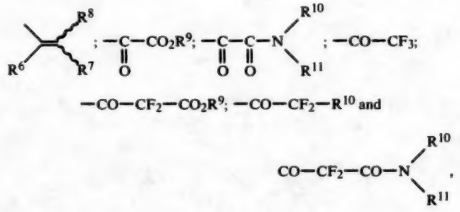
R_2 denotes hydrogen; (C_1–C_6)-alkyl; (C_6–C_{12})-aryl; (C_6–C_{12})-aryloxy; (C_7–C_{13})-aroyl; hydroxyl or (C_1–C_4)-alkoxy, with aryl, aryloxy and aroyl each optionally being substituted by one, two or three identical or different radicals from selected (C_1–C_4)-alkyl, phenyl-(C_1–C_3)-alkyl, (C_2–C_4)-alkenyl, phenyl-(C_2–C_4)-alkenyl, (C_1–C_4)-alkoxy, (C_2–C_4)-alkenyloxy, phenyl-(C_1–C_3)-alkoxy, halogen, nitro, hydroxyl, amino, (C_1–C_4)-alkylamino and di(C_1–C_4)-alkylamino, or one (C_1 or C_2)-alkylenedioxy, or R^1 and R^2 together represent benzylidene in which the phenyl ring is optionally substituted by one, two or three identical or different radicals selected from (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen, nitro, hydroxyl, amino, (C_1–C_4)-alkylamino and di-(C_1–C_4)-alkylamino, or one (C_1 or C_2)-alkylenedioxy, or R^1 and

R^2, together with the carbon atom carrying them, represent (C_3–C_6)-cycloalkyl which is optionally substituted by phenyl;

A denotes a radical from the group



R^3 denotes a radical selected from hydrogen; hydroxymethyl; formyl;

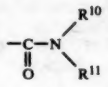


with

R^6 denoting hydrogen; (C_1–C_6)-alkyl or (C_6–C_{12})-aryl which is optionally substituted by one or two identical or different radicals selected from (C_1–C_4)-alkyl, (C_1 or C_2)-alkoxy and halogen, or one (C_1 or C_2)-alkylenedioxy;

R^7 denoting hydrogen; (C_1–C_6)-alkyl; cyano; (C_7–C_{13})-aroyl which is optionally substituted by one or two identical or different radicals selected from (C_1–C_4)-alkyl, (C_1 or C_2)-alkoxy, halogen and nitro, or one (C_1 or C_2)-alkylenedioxy; (C_1–C_6)-alkoxycarbonyl or (C_1–C_8)-alkanoyl;

R^8 denoting cyano; (C_7–C_{13})-aroyl or (C_6–C_{12})-aryl-(C_2–C_4)-alkanoyl, it being possible for each aryl to be substituted by one, two or three identical or different radicals selected from (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen, nitro and hydroxy, or one (C_1 or C_2)-alkylenedioxy; or (C_1–C_6)-alkanoyl; (C_1–C_6)-alkoxycarbonyl; benzyloxycarbonyl or a radical of the formula



R^9 denoting hydrogen; (C_1–C_6)-alkyl; phenyl-(C_1–C_4)-alkyl or diphenyl-(C_1–C_4)-alkyl;

R^{10} and R^{11} being identical or different and denoting hydrogen; (C_1–C_8)-alkyl; (C_6–C_{12}) -aryl or (C_6–C_{12})-aryl-(C_1–C_8)-alkyl, in which each aryl is optionally substituted by one, two or three identical or different radicals selected from (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen and hydroxyl, or one (C_1 or C_2)-alkylenedioxy; or (C_5–C_9)-cycloalkyl; or

X denotes oxygen, imino or N-(C_1–C_8) -alkylimino;

m is 0, 1, 2, 3, 4 or 5; and

n is 0 or 1;

or a physiological tolerated salt thereof

6. A method of inhibiting the neuropeptide degradation activity of prolyl endopeptidase comprising administering an effective amount of a compound of the formula I as claimed in claim 1 or a pharmaceutical by acceptable salt thereof.

4,983,624

NOVEL PROLINAL DERIVATIVES

Masaaki Toda, Osaka; Shuichi Ohuchida, Kyoto, and Hiroyuki Ohno, Shiga, all of Japan, assignors to Ono Pharmaceutical Co., Ltd, Osaka, Japan

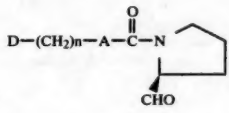
Filed Dec. 29, 1987, Ser. No. 139,231

Claims priority, application Japan, Dec. 29, 1986, 61-310151

Int. Cl.[5] A61K *31/40;* **C07D** *207/08*

U.S. Cl. 514—423 **12 Claims**

1. A novel prolinal derivative of the general formula:



(I)

wherein A represents a group of the general formula:

wherein R^1 represents a branched alkyl group of from 3 to 5 carbon atoms, an alkoxy group of from 1 to 5 carbon atom(s), a phenyl group, a benzyl group, a cycloalkyl group of from 4 to 6 carbon atoms or a (cycloalkyl of from 4 to 6 carbon atoms)-methyl group, or a group of the general formula:

wherein

m represents an integer of from 3 to 6,

n represent an integer of from 3 to 10,

D represents mono-, bi or tri-carbocyclic ring(s) containing not more than 15 carbon atoms which may be partially or fully saturated or aromatic, wherein said ring(s) represented by D is unsubstituted or substituted by from one to three of a member selected from the group consisting of a halogen atom, a nitro group, a trifluoromethyl group and an alkyl or alkoxy group of from 1 to 4 carbon atom(s).

12. A method for treating amnesia which comprises administering a therapeutically effective amount of the prolinal derivative of formula (I) depicted in claim 1.

4,983,625

PSORALENE-BASED BATH COMPOSITIONS FOR TREATMENT OF SKIN DISORDERS

Braham Shroot, and Josiane Allec, both of Antibes, France, assignors to Centre International de Recherches Dermatologiques (CIRD), Valbonne, France

Continuation-in-part of Ser. No. 145,046, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 845,836, Mar. 28, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,130

Claims priority, application Luxembourg, Apr. 1, 1985, 85829

Int. Cl.[5] A61K *31/35*

U.S. Cl. 514—455 9 Claims

1. A bath composition, for use in the treatment of psoriasis and other cutaneous disorders, said composition being in the form of an oily product and comprising

(a) 10 to 79.9 weight percent of a hydrophilic phase comprising a hydrophilic agent selected from the group consisting of

(i) lauryl alcohol polyoxyethylenated and/or polyoxypropylenated with 2 to 5 moles of ethylene oxide and-/or propylene oxide,

(ii) polyoxyethylenated fatty ester of glycerol with 5 to 10 moles of ethylene oxide,

(iii) sorbitan and/or sorbitol monolaurate polyoxyethylenated with 2 to 5 moles of ethylene oxide, and

(iv) a mixture of at least two of (i)–(iii), above,

(b) 20 to 89.9 weight percent of a lipophilic phase comprising a lipophilic agent selected from the group consisting

(1') ester of a fatty alcohol,

(2') ester of a fatty acid,

(3') saturated fatty alcohol,

(4') unsaturated fatty alcohol,

(5') saturated fatty acid,

(6') unsaturated fatty acid,

(7') a hydrocarbon,

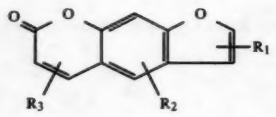
(8') monoglyceride of a fatty acid,

(9') diglyceride of a fatty acid,

(10') triglyceride of a fatty acid and

(11') a mixture of at least two of (1') to (10'), above, and

(c) 0.1 to 2 weight percent of an active component having the formula



wherein

R_1, R_2 and R_3 each independently represent hydrogen, branched or straight chain lower alkyl, —$COOR_4$ or —OR_5, wherein R_4 is lower alkyl and R_5 is hydrogen or lower alkyl, said bath composition giving rise to a homogeneous milky appearance when mixed with water.

4,983,626

ANTI-RHEUMATIC AGENTS AND THEIR USE

Roshdy Ismail, Siebengebirgs-Apotheke, Siebengebirgsallee 2, 5000 Köln 41, Fed. Rep. of Germany

Continuation of Ser. No. 700,462, Feb. 11, 1985, Pat. No. 4,612,194. This application Aug. 21, 1986, Ser. No. 898,499

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405240; Feb. 27, 1984, 3407024; Mar. 7, 1984, 3408260; Apr. 24, 1984, 3415250; May 2, 1984, 3416162; Aug. 7, 1984, 3429019; Sep. 7, 1984, 3432881; Sep. 7, 1984, 3432882

Int. Cl.[5] A61K *31/355*

U.S. Cl. 514—458 20 Claims

1. A method for enhancing blood circulation in a patient in need thereof comprising administering to said patient vitamin E in an amount therapeutically effective to enhance said blood circulation wherein vitamin E is administered in combination with a therapeutically effective amount of a vasodilator and/or a blood circulation-promoting agent selected from the group consisting of Bencyclan hydrogenfumarate, dihydroergotoxine methanesulfonate, Pentoxifylline, gingko flavoglycosides, Extract. Hippocastani, and functionally effective derivatives thereof.

4,983,627

NOVEL 6-ALKYL AND 6,8-DIALKYLBICYCLO(4.2.0)OCTANE DERIVATIVES

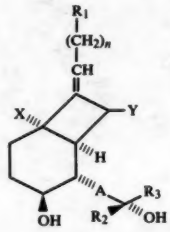
Counde O'Yang, Sunnyvale; Walter Kurz, Mountain View; Keith A. M. Walker, Los Altos Hills, and Helen Y. Wu, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 10, 1988, Ser. No. 269,811

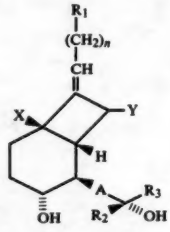
Int. Cl.[5] C07C *62/32;* A61K *31/21*

U.S. Cl. 514—510 46 Claims

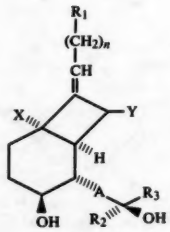
1. A compound of the formula (1), (2) or (3):



(1)



(2)



(3)

wherein:

A is —C≡C—, trans —HC=CH—, trans —CH=CHC-H_2— or —CH_2CH_2—;

X is lower alkyl of 1–6 carbon atoms;

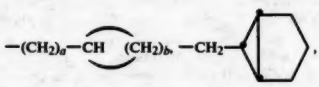
Y is hydrogen, exo-(lower alkyl) or endo-(lower alkyl);

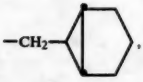
n is an integer from 2–4;

R_1 is —CH_2OH, —CHO, CO_2R or CO_2H, and the olefin formed by the $R_1(CH_2)_nCH$= moiety is either (E) or (Z);

R_2 is hydrogen or methyl, or optionally —CH=CH_2 when A is trans —CH=$CHCH_2$—; and

R_3 is linear or branched alkyl, alkenyl or alkynyl having 5–10 carbon atoms,





—$(CH_2)_m$-phenyl or CH_2O-phenyl;

in which each phenyl may be optionally substituted with lower alkyl, lower alkoxy, trifluoromethyl, or halogen. in which:

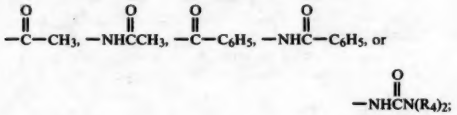
a is an integer of 0, 1 or 2;

b is an integer of 3–7;

m is an integer of 0, 1 or 2; and

R is

wherein X′ is



in which each R_4 is independently hydrogen or lower alkyl having 1–6 carbon atoms,

or a pharmaceutically acceptable, non toxic salt or alkyl ester thereof.

4,983,628

LEUKOTRIENE ANTAGONISTS

Richard Frenette; Joshua Rokach, Quebec, both of Canada; Masatoshi Kakushima, Hirochi, Japan, and Robert N. Young, Quebec, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

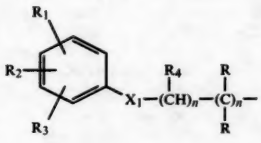
Continuation of Ser. No. 3,879, Jan. 16, 1987, abandoned, which is a continuation of Ser. No. 661,560, Oct. 17, 1984, Pat. No. 4,683,325, which is a continuation-in-part of Ser. No. 573,169, Jan. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 546,013, Oct. 27, 1983, abandoned. This application Jan. 3, 1989, Ser. No. 292,706

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[5] A61K *31/21*

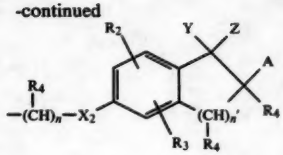
U.S. Cl. 514—510 **9 Claims**

1. Compounds having the formula:



I

-continued



wherein:

each R is independently H, OR_4, or together they form the group $=C(R_4)_2$;

R_1 is H, OH, formyl, R_5CO, or R_5OCO;

each R_2 and each R_3 is independently H, OH, alkyl of 1 to 6 carbon atoms which may be straight chain or branched; alkenyl of 2 to 6 carbon atoms which may be straight chain or branched; trifluoromethyl; alkoxy of 1 to 6 carbon atoms which may be straight chain or branched; SH; phenyl; phenyl substituted by alkyl of 1 to 3 carbon atoms or by halogen; benzyl; phenethyl; halogen amino; $N(R_4)_2$; $COOR_4$; CH_2OR_4; CH_2OR_4; formyl; CN; trifluoromethylthio; or nitro;

each R_4 is independently H or alkyl of 1 to 6 carbon atoms which may be straight chain or branched;

each R_5 is independently alkyl to 1 to 6 carbon atoms which may be straight chain or branched;

X_1 and X_2 are each independently oxygen, sulfur, sulfoxide, or sulfone;

Y and Z in combination are =O, or H and OH;

A is $—(C(R_4)_2)_s—COOR_4$;

each n is independently 0, 1, 2 or 3, with the proviso that n+n+n is not 0;

n′ is 1–3; and

s is 1–3;

or a pharmaceutically acceptable salt thereof.

4,983,629

11-HALOPROSTANE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS MEDICINAL AGENTS

Helmut Vorbruggen; Norbert Schwarz; Olaf Loge; Claus-Steffen Sturzebecher, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

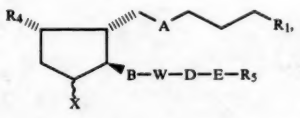
Continuation of Ser. No. 929,310, Nov. 12, 1986, Pat. No. 4,870,104, which is a continuation of Ser. No. 717,266, Mar. 8, 1985, abandoned. This application Jun. 21, 1989, Ser. No. 369,168

The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.

Int. Cl.[5] C07C *177/00*; A61K *31/557*

U.S. Cl. 514—530 **15 Claims**

1. An 11-chloro- or 11-fluoroprostane derivative of the formula

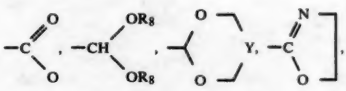


(I)

wherein

X is F or Cl,

R_1 is CH_2OH,



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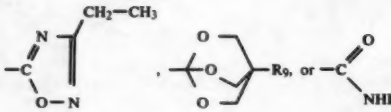


R_2 is (a) H; (b) C_{1-10} alkyl; (c) C_{1-10} alkyl substituted by halogen, C_{1-4} alkoxy, C_{6-10} aryl, C_{6-10} aroyl, C_{6-10} aryl, or C_{6-10} aroyl each substituted as defined below, dialkylamino or trialkylammonium; (d) phenacyl; (e) C_{6-10} aryl or C_{6-10} aryl substituted by 1–3 halogen atoms, phenyl, 1–3 C_{1-4}-alkyl groups, chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy, or C_{1-4} alkoxy; (f) C_{3-10} cycloalkyl or C_{3-10} cycloalkyl substituted by C_{1-4} alkyl; or (g) 5- or 6-membered aromatic heterocyclic ring containing an N, O, or S atom;

R_3 is an acyl group of a C_{1-15} hydrocarbon carboxylic or sulfonic acid, or a group defined for R_2;

R_4 is OR;

R is H, an acyl group of a C_{1-15} hydrocarbon carboxylic or sulfonic acid, tetrahydropyranyl, tetrahydrofuranyl, alpha-ethoxyethyl, trimethylsilyl, dimethylsilyl, tert-butylsilyl, or tribenzylsilyl;

R_5 is C_{3-10} cycloalkyl or C_{3-10} cycloalkyl substituted by C_{1-4} alkyl;

R_8 is C_{1-5} alkyl;

R_9 is H or methyl;

A is $—CH_2—CH_2—$ or cis—CH=CH—;

B is $—CH_2—CH_2—$, trans—CH=CH— or —C≡C—;

W is ethylenedioxymethylene or $—CH_2OR$, wherein R is as defined above;

Y is a single bond; C_{1-5} alkylene or C_{1-5} alkylene substituted by C_{1-4} alkyl;

D and E jointly represent a single bond or

D is C_{1-10} alkylene or C_{1-10} alkylene substituted by fluorine, C_{2-10}-alkenylene or C_{2-10}-alkenylene substituted by fluorine;

E is O, S, a single bond, a —C≡C— bond or $—CR_6=CR_7—$, wherein R_6 and R_7 are different from a physiologically acceptable salt thereof.

4,983,630

2,2-DIFLUOROCYCLOPROPYLETHANE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS PESTICIDES

Peter Wegner; Hartmut Joppien; Günter Hömberger, and Arnim Köhn, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

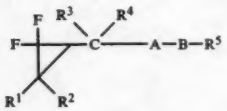
Filed Nov. 28, 1988, Ser. No. 276,870

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1988, 3740840

Int. Cl.[5] **C07C** *69/74;* **A01N** *53/00*

U.S. Cl. 514—531 **18 Claims**

1. 2,2-Difluorocyclopropylethane derivative of formula I



(I)

in which

R^{1-4} are hydrogen,

R^5 is hydrogen, an alkali metal or a corresponding equivalent of a divalent metal, C_{1-20}-alkyl, C_{2-20}-alkenyl, C_{2-20}-alkynyl, halo-C_{1-10}-alkyl, C_{1-3}-alkyl-C_{3-6}-cycloalkyl, C_{3-6}-cycloalkyl-C_{1-6}-alkyl, halo-C_{3-6}-cycloalkyl-C_{1-6}-alkyl, decahydronaphthalinyl, indanyl, adamantyl, adamantylmethyl, difluorocyclopropylethylcarbonyloxy-C_{1-10}-alkyl, difluorocyclopropylethylcarbonyloxydecahydronaphthalinyl, difluorocyclopropylcarbonyloxy-C_{1-3}-alkoxy-C_{1-3}-alkyl, phenyl-C_{1-6}-alkyl, phenyl-C_{2-6}-alkenyl, halobenzyl, C_{1-4}-alkylbenzyl, C_{1-3}-alkoxyphenyl-C_{1-6}-alkyl, phenoxybenzyl, α-cyanophenoxybenzyl, α-C_{1-3}-alkylphenoxybenzyl, ethoxy-(α-trifluoromethyl)benzyl, halophenyl(cyclopropyl)-C_{1-3}-alkyl, halophenoxy-C_{1-6}-alkyl, naphthyl-C_{1-6}-alkyl, methylthiazolyl-C_{1-6}-alkyl, tris(difluorocyclopropylmethylcarbonyloxymethyl)methyl, tri(C_{4-8}-cycloalkyl)stannyl, aryl, optionally substituted by one or more of C_{1-20}-alkyl, halo-C_{1-6}-alkyl, C_{1-16}-alkoxy, halo-C_{1-6}-alkoxy, phenyl-C_{1-6}-alkyl, phenyl-C_{1-6}alkoxy, C_{3-10}-cycloalkoxy, halo-C_{3-10}-cycloalkoxy, C_{3-6}-cycloalkylalkoxy, halo-C_{3-6}-cycloalkylalkoxy, C_{2-6}-alkenyloxy, halo-C_{2-6}-alkenyloxy, C_{2-6}-alkynyloxy, halo-C_{2-6}-alkynyloxy, alkylsulphonyloxy, alkylphenylsulphonyloxy, haloalkylsulphonyloxy, phenyl, halogen, amino, cyano, hydroxy, nitro, aryloxy, heterocycleoxy, haloaryloxy, arylamino, haloarylamino, C_{1-6}-alkoxycarbonyl, C_{1-6}-alkoxycarbonylmethyl, halo-C_{1-6}-alkoxycarbonyl, C_{1-2}-alkyldioxy, C_{1-6}-alkylthio, halo-C_{3-6}-cycloalkylalkylamino, halo-C_{3-6}-cycloalkyl-alkylcarbonyloxy, C_{1-6}-alkylamino or di-C_{1-6}-alkylamino, heterocycle, optionally substituted by halogen, C_{1-3}-alkyl or halo-C_{1-3}-alkyl, or the group $CONHR^8$, in which

R^8 is hydrogen, C_{1-6}-alkyl or phenyl, optionally substituted by one or more of C_{1-6}-alkyl, halo-C_{1-6}-alkyl, C_{1-16}-alkoxy, halo-C_{1-6}-alkoxy, phenyl-C_{1-6}-alkoxy, C_{3-10}-cycloalkoxy, halo-C_{3-10}-cycloalkoxy, C_{3-6}-cycloalkylalkoxy, halo-C_{3-6}-cycloalkylalkoxy, C_{2-6}-alkenyloxy, halo-C_{2-6}-alkenyloxy,C_{2-6}-alkynyloxy, halo-C_{2-6}-alkynyloxy, alkylsulphonyloxy, haloalkylsulphonyloxy, phenyl, halogen, amino, cyano, hydroxy, nitro, aryloxy, haloaryloxy, arylamino, haloarylamino, C_{1-6}-alkoxycarbonyl, halo-C_{1-6}-alkoxycarbonyl, C_{1-6}-alkylthio, halo-C_{3-6}-cycloalkylalkylamino, C_{1-6}-alkylamino or di-C_{1-6}-alkylamino,

A is carbonyl, thiocarbonyl or methylene,

B is oxygen, sulphur or NR^6, in which,

R^6 is hydrogen, C_{1-6}-alkyl or C_{3-12}-cycloalkyl, phenyl or COR^7, in which

R^7 is C_{1-6}-alkyl; halo-C_{1-6}-alkyl; phenyl, optionally substituted by one or more of C_{1-6}-alkyl, halo-C_{1-6}-alkyl, C_{1-16}-alkoxy, halo-C_{1-6}-alkoxy, phenyl-C_{1-6}-alkoxy, C_{3-10}-cycloalkoxy, halo-C_{3-10}-cycloalkoxy, C_{3-6}-cycloalkylalkoxy, halo-C_{3-6}-cycloalkylalkoxy, C_{2-6}-alkenyloxy, halo-C_{2-6}-alkenyloxy, C_{2-6}-alkynyloxy, halo-C_{2-6}-alkynyloxy, alkylsulphonyloxy, haloalkylsulphonyloxy, phenyl, halogen, amino, cyano, hydroxy, nitro, aryloxy, haloaryloxy, arylamino, haloarylamino, C_{1-6}-alkoxycarbonyl, halo-C_{1-6}-alkoxycarbonyl, C_{1-6}-alkylthio, halo-C_{3-6}-cycloalkylalkylamino, C_{1-6}-alkylamino or di-C_{1-6}-alkylamino; C_{3-6}-cycloalkyl; C_{1-6}-alkylamino or C_{1-6}-alkoxy

wherein any heterocycle moiety is a 5- or 6-membered ring containing at least one nitrogen, oxygen or sulfur atoms which optionally carries a fused benzo ring.

4,983,631

AGENT AND METHOD FOR EXTERNAL TREATMENT OF DOMESTIC ANIMALS

Roland Palm, Mobodarne 7861, S-826 00 Söderhamn, Sweden

PCT No. PCT/SE87/00536, § 371 Date Jun. 8, 1988, § 102(e) Date Jun. 8, 1988, PCT Pub. No. WO88/03794, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 16, 1987, Ser. No. 203,990

Claims priority, application Sweden, Nov. 19, 1986, 8604943

Int. Cl.[5] **A61K** *31/23, 31/19, 31/20, 31/125*

U.S. Cl. 514—552 **8 Claims**

1. An agent for treating the skin of domestic animals, which, on a percent by volume basis, consists essentially of the following ingredients:

15–30%: soft soap

4–10%: peanut oil

4–10%: spirit of camphor
1–5%: spirit of vinegar
30–50%: lower aliphatic alcohol
20–40%: water.

4,983,632

USE OF GAMMA-HYDROXYBUTYRIC ACID SALTS FOR PREPARING PHARMACEUTICAL COMPOSITIONS FOR USE IN THE TREATMENT OF ALCOHOLISM, AND THE COMPOSITIONS OBTAINED

Gian Luigi Gessa; Fabio Fadda, both of Cagliari, and Chiara Mormile Di Campochiaro, Sanremo, all of Italy, assignors to Laboratorio Farmaceutico C.T. S.r.l., Sanremo, Italy

Filed Jun. 2, 1989, Ser. No. 361,490
Claims priority, application Italy, Jun. 3, 1988, 20859 A/88
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—557 **10 Claims**

1. A method of treating ethyl alcohol dependency in a patient, which comprises:

administering to said patient an effective amount of a pharmaceutically acceptable salt of gamma-hydroxy butyric acid for treating said dependency.

4,983,633

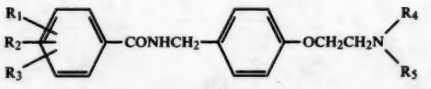
AMIDE COMPOUNDS, PROCESS FOR PREPARING THE SAME, AND COMPOSITION FOR ACTIVATING GASTRIC MOTOR FUNCTION CONTAINING THE SAME

Yasuo Itoh, Katsuyamashi; Hideo Kato, Fukuishi; Eiichi Koshinaka, Katsuyamashi; Nobuo Ogawa, Katsuyamashi; Hiroyuki Nishino, Katsuyamashi, and Jun Sakaguchi, Katsuyamashi, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi, Japan

Filed Sep. 2, 1988, Ser. No. 241,028
Claims priority, application Japan, Sep. 5, 1987, 62-221211; Sep. 22, 1987, 62-236250; Sep. 29, 1987, 62-242765; Oct. 5, 1987, 62-249749
Int. Cl.[5] C07C *233/73, 233/78;* A61K *31/165*
U.S. Cl. 514—622 **14 Claims**

1. Amide-compound selected from N-[4-[2-(dimethylamino)ethoxyl-benzyl]-3,4-dimethoxybenzamide pharmacologically-acceptable acid-addition salts thereof.

7. A method for the treatment of a subject suffering from an ailment associated with inadequate gastric motor function, comprising the step of administering to the said subject an amount of an amide compound selected from those represented by the formula (I)



(I)

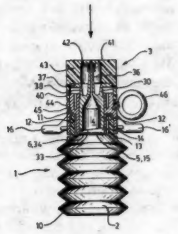
wherein R_1 represents hydrogen, lower alkoxy, hydroxy, lower alkyl, halogen, amino which can be substituted by lower alkyl, nitro, cyano, sulfamoyl which can be substituted by lower alkyl, R_2 represents hydrogen, lower alkoxy, hydroxy, lower alkyl, halogen, amino, nitro, and wherein R_1 and R_2 can be combined to form methylenedioxy R_3 means hydrogen, lower alkyl, halogen, or amino, and wherein R_4 and R_5 may be the same or different and each represents lower alkyl and wherein R_4 and R_5 may be combined together with nitrogen to form 1-pyrrolidinyl or piperidino, and pharmacologically-acceptable acid-addition salts thereof, which is effective for the alleviation of such ailment.

4,983,634

TREATMENT OF MASTITIS AND APPLICATOR THEREFOR

Michael P. Corby, 19, Swinton Rise, Ravenshead, Nottinghamshire, England

Filed Dec. 27, 1988, Ser. No. 290,629
Claims priority, application United Kingdom, Dec. 24, 1987, 8730107
Int. Cl.[5] A01N *37/18, 25/02;* A61K *31/165;* A61M *1/06*
U.S. Cl. 514—622 **8 Claims**



3. A method of treating mastitis in at least a portion of mammal's udder having a teat thereon, comprising the steps of:

(i) substantially voiding said udder as far as possible;

(ii) breaking a seal in a treatment applicator to mix a bactericide stored in a first portion of said applicator with an aqueous carrier stored in a second portion of said applicator to prepare a fresh bactericidal solution, the bactericide selected from the group consisting of (mon)oxychlorosene, sodium oxychlorosene, and mixtures thereof;

(iii) inserting a tip of the applicator into the teat;

(iv) infusing a quantity of said fresh solution through the teat into an infected area of said udder; and

(v) repeating steps (i) through (iv) as necessary until a full course of treatment is completed.

4,983,635

FORTIFIED QUATERNARY AMMONIUM COMPOUND WITH DUAL SYNERGISTIC PHENOLS

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20914

Filed Sep. 12, 1988, Ser. No. 243,088
Int. Cl.[5] A61K *31/14*
U.S. Cl. 514—643 **4 Claims**

1. A new formulation for disinfection and sanitization, comprising,

Dual chain quaternary ammonium (N-Alkyldimethylethylbenzyl ammonium chloride N-alkyldimethylbenzyl ammonium chloride)	47.70 grams
Ortho phenyl phenol	0.80 grams
Para tertiary amyl phenol	0.80 grams
Isopropyl alcohol	10.00 grams
Citric acid	0.40 grams
Water	40.30 grams
Total	100.00 GRAMS

4,983,636

COMPOSITION AND METHOD OF TREATING SELECTED MALIGNANT CONDITIONS

Setsuo Takeuchi, Higashiyamato, and Mutsuyuki Kochi, Matsudo, both of Japan, assignors to Rikagaku Kenkyusho Wako, Wako and Mutsuyuki Kochi, Matsudo, both of, Japan

Continuation of Ser. No. 44,795, Apr. 30, 1987, abandoned, and Ser. No. 720,538, Apr. 8, 1985, abandoned, which is a continuation of Ser. No. 573,592, Jan. 25, 1984, abandoned, which is a continuation of Ser. No. 508,987, Jun. 28, 1983, abandoned, which is a continuation of Ser. No. 296,994, Aug. 27, 1981, abandoned, which is a continuation of Ser. No. 84,540, Oct. 15, 1979, abandoned, which is a continuation of Ser. No. 942,402, Sep. 14, 1978, abandoned, which is a continuation of Ser. No. 774,867, Mar. 7, 1977, abandoned. This application Oct. 31, 1988, Ser. No. 265,415

Claims priority, application Japan, Mar. 9, 1976, 51-25225

Int. Cl.[5] A61K *31/11, 31/715*

U.S. Cl. 514—699 14 Claims

1. A composition, effective against a tumor selected from the group consisting of adenomatous carcinoma, leukaemia, squamous cell carcinoma, sarcoma and lymphosarcoma which comprises an inclusion compound of benzaldehyde in cyclodextrin as the active ingredient, wherein the inclusion compound contains 80 to 100 mg of benzaldehyde per gram of the inclusion compound.

4,983,637

METHOD FOR TREATING VIRAL INFECTION OF HIV

Stephen Herman, 9341 Hazel Cir., Villa Park, Calif. 92667

Continuation-in-part of Ser. No. 211,378, Jun. 24, 1989, abandoned. This application Jun. 8, 1989, Ser. No. 363,628

Int. Cl.[5] A01N *31/00, 31/04;* A61K *31/045, 31/07*

U.S. Cl. 514—724 8 Claims

1. A method for treating viral infections of HIV in a mammal, comprising the parenteral application of a pharmacologically antiviral effective amount of an ozonide of a terpene in a pharmaceutically acceptable carrier or excipient.

4,983,638

CATALYST AND METHOD FOR PRODUCING LOWER ALIPHATIC ALCOHOLS

Suk-Fun Wong, Stormville, N.Y.; David A. Storm, Montvale, N.J., and Mahendra S. Patel, Hopewell Juction, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 17, 1989, Ser. No. 380,240

Int. Cl.[5] C07C *27/06*

U.S. Cl. 518—714 17 Claims

1. A method for preparing lower aliphatic alcohols which comprises reacting carbon monoxide and hydrogen in the presence of a catalyst composition which includes rhodium, cobalt, molybdenum, cesium and from about 1 part per million to about 100 parts per million of chlorine.

4,983,639

EXPANDABLE STYRENE POLYMERS AND THEIR PREPARATION

Klaus Hahn, Kirchheim; Uwe Guhr, Gruenstadt, and Hans Hintz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 28, 1990, Ser. No. 486,434

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908238

Int. Cl.[5] C08J *9/18, 9/20*

U.S. Cl. 521—59 3 Claims

1. An expandable styrene polymer containing

(a) from 95 to 99.5% by weight of polystyrene,

(b) from 0.5 to 5% by weight of a styrene-soluble styrene/acrylonitrile copolymer, the content of acrylonitrile being not less than 0.15% by weight, based on the sum of (a) and (b), and

(c) from 3 to 10% by weight, based on the sum of (a) and (b), of a C_3–C_6-hydrocarbon as a blowing agent, with or without

(d) conventional additives in effective amounts.

4,983,640

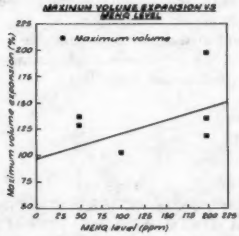
METHODS FOR PREPARING A FORMED CELLULAR PLASTIC MATERIAL PATTERN EMPLOYED IN METAL CASTING

Norman G. Moll, Sanford, and David R. Johnson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 149,288, Jan. 28, 1988, Pat. No. 4,790,367. This application Dec. 12, 1988, Ser. No. 283,332

Int. Cl.[5] C08J *9/16*

U.S. Cl. 521—60 35 Claims



1. An expandable plastic material particle comprising:

(A) a plastic material, polymerized from one or more monomers, containing a majority, by weight of the plastic material, of monomeric repeat units of the formula:

$$—CH_2CR'(COOR)—$$

wherein R is selected from the group consisting of alkanes having 1–4 carbon atoms (C), hydroxy alkanes having 1–4 C and cycloalkanes having 3–6 C, and R′ is selected from the group consisting of CH_3 and C_2H_5;

(B) a volatile blowing agent contained within the plastic material;

(C) an inhibitor for the monomer(s) incorporated into the plastic material upon polymerization of the monomer(s); and

(D) a diunsaturated polymerizable monomer cross-linking agent incorporated into the plastic material upon polymerization of the monomer(s) to provide crosslinking of the plastic material.

4,983,641

METHOD FOR CONTROLLING THE CURE RATE OF SILICONE FOAM

David C. Gross, Schenectady; Donald S. Johnson, Scotia, both of N.Y., and Connie H. Shannon, Evansville, Ind., assignors to General Electric Company, Waterford, N.Y.

Filed Apr. 2, 1990, Ser. No. 503,183

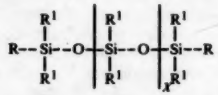
Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—82 32 Claims

1. A method for controlling the cure time of a silicone foamable composition comprising by weight:

(A) a silicone composition comprising by weight:

(1) 100 parts of a a vinyl-terminated polydiorganosiloxane of the formula:

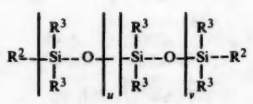


wherein R and R^1 are selected from the group consisting of substituted or unsubstituted hydrocarbon radicals of from 1 to 20 carbon atoms, such that the polymer contains from 0.0002 to 3% by weight vinyl and x varies such that the viscosity of the polymer varies from 100 to 1,000,000 centipoise at 25° C.;

(2) about 25 to about 140 parts per million of a platinum catalyst;

(3) about 1 to 200 parts by weight of a reinforcing or extending filler per hundred parts of foamable composition;

(B) 1 to 50 parts of a substantially linear hydride polysiloxane having the formula



wherein R^2 is selected independently from the group consisting of hydrogen, alkyl radicals of from 1 to 8 carbon atoms, halo substituted alkyl radicals of from 1 to 8 carbon atoms, aryl radicals of from 6 to 14 carbon atoms, and halo substituted aryl radicals of from 6 to 14 carbon atoms; and R^3 is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms, aryl radicals of from 6 to 14 carbon atoms, halo aryl radicals of from 6 to 14 carbon atoms, and fluoroalkyl radicals of from 3 to 8 carbon atoms; u and v are integers which can vary sufficiently to provide a hydride polysiloxane having a viscosity of from about 5 to about 10,000 centipoise at 25° C.; and

(C) about 0.1 to about 5 parts of a hydroxyl source selected from the group consisting of water, organic alcohol, or a mixture of the foregoing; comprising the step of adding to the composition about 1 to about 5 parts by weight of an aqueous buffer solution having a pH of about 2 to about 10, wherein cure time is increased if the pH of the buffer solution is higher than the pH of the composition prior to the addition thereto of the buffer solution, and wherein cure time is decreased if the pH of the buffer solution is lower than the pH of the composition prior to the addition thereto of the buffer solution.

4,983,642

FOAMABLE SILICONE RUBBER COMPOSITION AND FOAMED SILICONE RUBBER BODY THEREFROM

Akio Nakano, and Hirosi Takei, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1990, Ser. No. 534,061

Claims priority, application Japan, Jun. 7, 1989, 1-144470

Int. Cl.[5] C08G *77/00*; C08J *9/10*

U.S. Cl. 521—88 **6 Claims**

1. A foamable silicone rubber composition which comprises, as a blend:

(a) 100 parts by weight of an organopolysiloxane represented by the average unit formula

$$R_aSiO_{(4-a)/2},$$

in which R is an unsubstituted or substituted monovalent hydrocarbon group and the subscript α is a positive number in the range from 1.98 to 2.05, having an average degree of polymerization of at least 300;

(b) from 10 to 150 parts by weight of a finely divided silica powder having a specific surface area of at least 50 m^2/g;

(c) from 3 to 20 parts by weight of an α,ω-dihydroxy diorganopolysiloxane represented by the general formula

$$HO—(—SiR^1{}_2—O—)_m—(—SiMe_2—O—)_n—H,$$

in which Me is a methyl group, R^1 is an unsubstituted or substituted monovalent hydrocarbon group, at least one of the groups denoted by R^1 in each of the units of the formula $—SiR^1{}_2—O—$ being a phenyl group or an alkyl group having 2 to 10 carbon atoms, the subscript m is a positive integer not exceeding 10 and the subscript n is zero or a positive integer not exceeding 20 with the proviso that m+n is at least 2;

(d) from 0.1 to 40 parts by weight of a thermally decomposable organic blowing agent; and

(e) from 0.1 to 10 parts by weight of an organic peroxide.

4,983,643

POLYUREA ELASTOMERS WITH REDUCED BRITTLENESS

Frank Sanna, Jr., Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 8, 1989, Ser. No. 363,572

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—159 **28 Claims**

1. A process for the production of an optionally cellular, polyurea elastomer molding which comprises reacting as a one-shot system by the RIM process at an isocyanate index of about 70 to 130 a mixture containing

(I) a polyisocyanate component having an isocyanate content of about 10 to 30% by weight which comprises an isocyanate-terminated prepolymer prepared by reacting a polyisocyanate with a non-fatty, hydroxy polyester having a hydroxyl functionality of 1 to 4 and a molecular weight of about 500 to 4,000, provided that if the hydroxy polyester is based on an aliphatic monocarboxylic acid, the aliphatic monocarboxylic acid is a non-fatty monocarboxylic acid containing less than 12 carbon atoms.

(II) a polyether having at least two isocyanate-reactive groups and a molecular weight of 1800 to 12,000 in which at least 50% of the isocyanate-reactive groups are primary and/or secondary amino groups,

(III) about 5 to 50% by weight, based on the weight of component (II), of a chain extender comprising a sterically hindered aromatic diamine,

provided that the reaction mixture is capable of being reacted at a mold temperature of 65° C. with a demold time of 35 seconds to produce an elastomer molding which is not brittle.

4,983,644

DENTAL ADHESIVE COMPOSITION

Nobuhiro Mukai, Hiroshima; Hitoshi Ige, Ohtake; Takayuki Makino, Ohtake, and Junko Atarashi, Ohtake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,804

Claims priority, application Japan, Jun. 21, 1988, 63-152974

Int. Cl.[5] C08F *2/46*

U.S. Cl. 522—14 **10 Claims**

1. A dental adhesive composition comprising:

(a) at least one isocyanate-group-containing urethane prepolymer,

(b) at least one isocyanate-group-containing silane compound,

at least one radical-polymerizable unsaturated monomer, and

(d) at least one initiator selected from the group consisting of redox polymerization initiators and photopolymerization initiators.

4,983,645

PHOTOINITIATORS AS LIGHT SENSITIVE DEGRADANTS FOR POLYETHYLENE

Frederick C. Schwab, Metuchen, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1989, Ser. No. 378,109
Int. Cl.[5] C08F 2/46
U.S. Cl. 522—47 20 Claims

1. A composition consisting essentially of linear polyethylene and an amount of camphorquinone which amount is effective to accelerate the degradation of the polyethylene on exposure to ultraviolet light.

4,983,646

ORGANOMETALLIC COMPLEXES OF ESTROGENS AND THEIR APPLICATION TO THE DETERMINATION OF HORMONE RECEPTORS

Gérard Jaouen; Anne Vessieres, both of La Haye les Roses, and Siden Top, Evry, all of France, assignors to Centre National de la Recherche Scientifique

Continuation of Ser. No. 893,218, Aug. 4, 1986, abandoned, which is a continuation of Ser. No. 534,093, Sep. 20, 1983, abandoned. This application Jul. 24, 1988, Ser. No. 384,866
Claims priority, application France, Sep. 23, 1982, 82 16024
Int. Cl.[5] C07J 9/00
U.S. Cl. 552—630 9 Claims

1. An estrogen complex comprising an estrogen or estrogen derivative complex with an organometallic compound containing at least one free carbonyl ligand, the estrogen complex containing at least one free hydroxyl radical in the 17-position and no free phenolic hydroxyl radical in the α-position to the site where the organometallic compound is attached.

4,983,647

REINFORCED POLYPROPYLENE COMPOSITION

Kouhei Ueno; Tomohiko Akagawa, and Yoshifumi Nakano, all of Sakai, Japan, assignors to Ube Industries, Ltd., Japan

Filed Nov. 8, 1989, Ser. No. 433,273
Claims priority, application Japan, Nov. 8, 1988, 63-280328
Int. Cl.[5] C08K 13/04, 3/34; C08L 23/26
U.S. Cl. 523—220 8 Claims

1. A reinforced polypropylene composition comprising:
(a) 45–75% by weight of (1) a modified copolymer obtained by modifying a first ethylene-propylene block copolymer, which is crystalline and has an ethylene content of 2–30% by weight, by reaction of 100 parts by weight of said first copolymer with 0.01–3 parts by weight of an unsaturated acid or a silane having an ethylenically unsaturated bond in the presence of 0.05–1 part by weight of an organic peroxide, or (2) a mixture of said modified copolymer and said first copolymer,
(b) 3–20% by weight of a second ethylene-propylene copolymer rubber having an ethylene content of 30–80% by weight;
(c) 2–12% by weight glass fiber; and
(d) 15–35% by weight of a mica admixture of mica (A) having an average particle diameter of 40–90 μm and an aspect ratio of 30–65 and mica (B) having an average particle diameter of 90–160 μm and an aspect ratio of 40–85, the weight ratio of (B)/(A) being 0.25–4.

4,983,648

PREPARATION OF ADDITIVE MODIFIED THERMOPLASTIC BLEND

Michael K. Laughner; Kenneth R. Shaw, and Ronald R. Smith, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 141,184, Mar. 9, 1988, abandoned. This application May 1, 1989, Ser. No. 346,262
Int. Cl.[5] C08J 3/22; C08L 69/00
U.S. Cl. 523—351 9 Claims

1. A process for preparing molded objects comprising:
(1) providing a concentrate resin comprising (a) a polycarbonate resin, an aromatic polyester carbonate resin or a mixture thereof; (b) at least one additive selected from the group consisting of colorants, pigments, thermal stabilizers, ultraviolet stabilizers, radiation stabilizers, mold release additives, ignition resistant additives, fillers, reinforcing aids, blowing agents, plasticizers, flow enhancers, lubricants, anti-fogging agents, anti-static compositions, anti-blocking compounds, and biocidal agents; and (c) a rubbery polymer;
(2) providing a let-down resin comprising a thermoplastic resin substantially free of additives that is capable of dispersing the concentrate resin;
(3) melt combining the concentrate resin and let-down resin in a weight ratio from about 1:200 to about 1:3 in a molding machine used to prepare molded thermoplastic objects said molding machine being incapable of obtaining thorough dispersion of concentrate resin in the let-down resin unless the concentrate resin contains a rubbery polymer said molding machine not being an extruder; and
(4) preparing a molded object from the combined resins by the direct molding thereof.

4,983,649

STABILIZED POLYKETONE BLEND

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1989, Ser. No. 351,368
Int. Cl.[5] C08L 1/02
U.S. Cl. 524—13 14 Claims

1. A composition stabilized against loss of apparent crystallinity when subjected to melting and crystallization cycles which comprises a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon having incorporated therein a stabilizing quantity of a finely divided cellulose.

4,983,650

FINE POLISHING COMPOSITION FOR WAFERS

Shigeo Sasaki, Yokkaichi, Japan, assignor to Monsanto Japan Limited, Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 290,367
Claims priority, application Japan, Dec. 29, 1987, 62-333027; Jun. 27, 1988, 63-156691
Int. Cl.[5] C08K 3/36, 5/20, 7/10; C08G 59/52
U.S. Cl. 524—27 8 Claims

8. The fine polishing composition according to claim 2, wherein the water-soluble salt is at least one compound composed of a combination of a cation selected from the group consisting of lithium ion, sodium ion, potassium ion, cesium ion and ammonium ion and an anion selected from the group consisting of fluorine ion, chlorine ion, bromine ion, iodine ion, sulfuric acid ion, nitric acid ion, perchloric acid ion, carbonic acid ion, formic acid ion, acetic acid ion, acrylic acid ion and oxalic acid ion.

4,983,651

DEGRADABLE PLASTICS

Gerald J. L. Griffin, London, England, assignor to Epron Industries Limited, England

Filed Apr. 18, 1988, Ser. No. 182,949
Claims priority, application United Kingdom, May 21, 1987, 8712009
Int. Cl.[5] C08L 3/00; C08F 8/00; C08G 63/48, 63/91
U.S. Cl. 524—47 11 Claims

1. A composition for preparing biodegradable articles comprising a blend of
a stable polymer selected from the group consisting of polyethylene, polypropylene and styrene;
an anti-oxidant;
starch;
a butadiene-styrene copolymer; and

a transition metal organic salt selected from the group consisting of the metal salts of stearate, oleate, behemate, myristate, erucate, linoleate, napthenate, acetonyl acetate, hydroxyquinolinate and metalamine.

4,983,652

POLYMER COMPLEX ADHESIVE COMPOSITIONS

Pawan K. Agarwal, Bridgewater, N.J., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

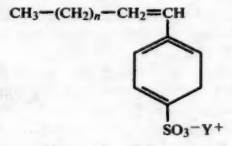
Filed Dec. 21, 1988, Ser. No. 287,422

Int. Cl.[5] C08L *9/00, 79/00, 81/08, 95/00*

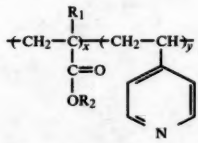
U.S. Cl. 524—66 11 Claims

1. An adhesive composition which comprises:

(a) a copolymer complex of an amine containing co-polymer and a neutralized sulfonated polymer having about 0.2 to 3 weigh percent of chemically combined sulfur wherein said neutralized sulfonated polymer comprises at least 80% by weight of at least one conjugated diene having from 4 to 12 carbon atoms and a minor proportion of a metal or amine neutralized sulfonate monomer characterized by the formula:



wherein n=1 or 2, wherein said sulfonate containing copolymer has a level of crystallinity of less than 25% and the polymeric backbone of said sulfonate containing copolymer has a solubility parameter of less than 10.5 and Y is said amine containing copolymer and is characterized by the formula:



wherein R_1 is H or an alkyl group having about 1 to about 8 carbon atoms, R_2 is an alkyl group having about 1 to about 18 carbon atoms, x is about 50 to about 99.8 weight percent, y is about 0.136 to about 34 weight percent, and a minimum of three basic groups must be present on the average per polymer molecule and the basic nitrogen content generally will range from 2 meq. per 100 grams of polymer up to 500 meq. per 100 g, wherein a weight ratio of said neutralized sulfonate containing copolymer to said amine containing copolymer is 20/1 to 1/20; and

(b) about 25 to about 200 parts by weight of a hydrocarbon tackifying resin based on a petroleum or coal tar distillate per 100 parts by weight of said sulfonate containing polymer.

4,983,653

POLYESTER SHRINKABLE FILM CONTAINING BENZOTRIAZOLE

Yujiro Fukuda, Machida, and Hiromi Yamashita, Yokohama, both of Japan, assignors to Diafoil Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 119,623, Nov. 12, 1987. This application Apr. 6, 1989, Ser. No. 333,977

Claims priority, application Japan, Nov. 12, 1986, 61-269251; Dec. 11, 1986, 61-295590; Dec. 15, 1986, 61-298427; Feb. 17, 1987, 62-33731; Mar. 11, 1987, 62-56236; Jun. 11, 1987, 62-145753; Oct. 26, 1987, 62-269765; Apr. 9, 1988, 63-87948

The portion of the term of this patent subsequent to May 2, 2008, has been disclaimed.

Int. Cl.[5] C08K *5/34;* C08G *63/00, 63/88*

U.S. Cl. 524—91 5 Claims

1. A polyester shrinkable film containing from 0.1 to 20% by weight of an ultraviolet absorber having 10% weight loss temperature (T_{10}) upon thermogravimetric analysis of not lower than 200°C., which film has a shrinkage from 30 to 80% in one direction of either the longitudinal direction or the transverse direction and a shrinkage from −5 to 10% in the other direction perpendicular to the main shrinking direction after treatment of 5 minutes at 100° C. in an air oven, and a light transmittance at a wavelength of 390 nm of not greater than 20%.

4,983,654

PHOSPHATE/EPOXY STABILIZER FOR EXTRUDABLE POLYESTER BLENDS

Mo-Fung Cheung, Farmington Hills; Amos Golovoy, Canton, and Henk van Oene, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,255

Int. Cl.[5] C08K *5/3492;* C08G *8/10, 8/28, 59/40*

U.S. Cl. 524—100 4 Claims

1. A stabilizer useful to retard transesterification in moldable polymer blends comprising polyester, wherein the stabilizer comprises:

I. a phosphate-epoxy adduct which is the reaction product of:

(A) phosphate being selected from mono- and di- esters of orthophosphoric acid, said mono- and di- ester respectively having two and one ionizable hydrogen atoms; and

(B) epoxy; wherein said phosphate and said epoxy are reacted in amounts so as to react at least about one of said ionizable hydrogen atoms of said phosphate with an epoxide group of said epoxy, and

II. a mixture of:

(i) reactive functionality component selected from compounds having (1) imide or (2) oxazoline functionality; and

(ii) hindered phenol component;

wherein said phosphate-epoxy adduct comprises at least about 51 weight percent of said stabilizer.

4,983,655

BLOCKED POLYISOCYANURATE COMPOUND AND PLASTISOL COMPOSITION CONTAINING SAME

Yoshihiro Nakata, Takatsuki, and Tadao Kunishige, Kusatsu, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1989, Ser. No. 370,790

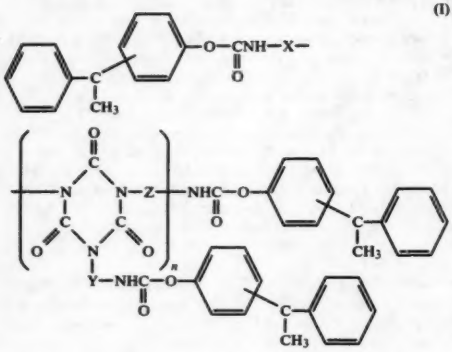
Claims priority, application Japan, Jun. 24, 1988, 63-157649; Jun. 25, 1988, 63-157448

Int. Cl.[5] C08K *5/3462;* C08G *18/28;* C07D *251/00*

U.S. Cl. 524—101 9 Claims

1. A blocked polyisocyanurate compound of the general formula (I):

(I)



wherein X, Y and Z are the same or different and are each a tolylene diisocyanate moiety or a diphenylmethane diisocyanate moiety where all NCO groups are excluded, and n is an integer of 1 to 10.

4,983,656

AQUEOUS PRESSURE-SENSITIVE ADHESIVE

Toshiyuki Ito; Yorinobu Ikeda; Yasuhisa Watanabe, and Hiroshi Tadenuma, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,877

Claims priority, application Japan, Mar. 14, 1988, 63-59594

Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—109 **13 Claims**

1. An aqueous pressure-sensitive adhesive consisting essentially of (1) 100 parts by weight (in terms of solids content) of an aqueous copolymer emulsion obtained by emulsion-polymerizing a monomer mixture consisting of 70–99.9% by weight of at least one alkyl (meth)acrylate in which the alkyl group has 4–12 carbon atoms, 0.1–10% by weight of an α,β-unsaturated carboxylic acid and 0–29.9% by weight of a monomer copolymerizable therewith, said copolymer being of a glass transition temperature (Tg) of −40° C. or less, and said aqueous copolymer emulsion being neutralized with ammonia, (2) 0.1–10 parts by weight of an alkali metal salt of phosphoric acid ester, and (3) a polyglycidyl compound in such an amount that the proportion of the epoxy group in the polyglycidyl compound is 0.1–3 equivalents per equivalent of the carboxyl group in the aqueous copolymer.

4,983,657

SYNERGISTIC MIXTURE FOR POLYOLEFIN STABILIZATION

Antonín Humplík; Mária Benecková; Pavol Caucík; Július Durmis; Marcela Göghová; Milan Karvas; Ivo Orlík, and Marta Povazancová, all of Bratislava, Czechoslovakia, assignors to Vyskumny ústav chemickej technológie vyskumná a vyvojova organizácia, Bratislava, Czechoslovakia

Filed May 31, 1989, Ser. No. 359,775

Claims priority, application Czechoslovakia, May 31, 1988, 3718-88

Int. Cl.[5] C08K *5/526*; C09K *15/32*

U.S. Cl. 524—120 **14 Claims**

1. A stabilizer composition for polymers comprising an alkylated aralkylphenol in an amount from about 0.5 to 50 weight percent and a bis (aralkylphenyl) pentaerythritoldiphosphite in an amount from about 99.5 to 50 weight percent.

4,983,658

THERMOPLASTIC MOULDING COMPOSITIONS WITH FLAME-REPELLENT PROPERTIES

Hans-Jürgen Kress; Heremann Kauth, both of Krefeld; Horst Peters, Leverkusen; Christian Lindner, Cologne, and Friedemann Müller, Neuss, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 913,336, Sep. 30, 1986, abandoned, which is a continuation of Ser. No. 762,941, Aug. 6, 1985, abandoned. This application Mar. 27, 1989, Ser. No. 329,201

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430235; Oct. 3, 1984, 3436162; Apr. 6, 1985, 3512638

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.[5] C08K *5/52, 5/53*

U.S. Cl. 524—141 **2 Claims**

1. A process for preparing a thermoplastic moulding composition with flame repellant properties consisting of

(A) 20 to 85 parts by weight of a thermoplastic aromatic polycarbonate,

(B) 5 to 50 parts by weight of a graft polymer of

(i) 5 to 90 parts by weight of a mixture of

(a) 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof and

(b) 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, on

(ii) 95 to 10 parts by weight of a rubber with a glass transition temperature of 10° C. or less,

(C) 5 to 70 parts by weight of a thermoplastic copolymer of

(i) 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof and

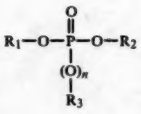
(ii) 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, and,

(D) 3 to 15 parts by weight of a low molecular weight or high molecular weight halogen compound, wherein the halogen content resulting from components (A)+(D) is from 3% to 10% by weight, based on the total weight of components (A)+(D) and wherein the halogen content resulting from component (D) can thus also be introduced via the high molecular weight polycarbonate according to component (A),

the parts by weight being based on in each case 100 parts by weight of (A)+(B)+(C) and (D), which composition additionally contains

(E) 1 to 15 parts by weight of a phosphorus compound of the formula (I)

(I)



wherein

R_1, R_2 and R_3 independently of one another are optionally halogenated C_1–C_8-alkyl or optionally halogenated C_6–C_{20}-aryl radicals, and n is 0 or 1, and

(F) 0.05 to 1 part by weight of a tetrafluoroethylene polymer with an average particle size of 0.05 to 20 μm and a density of 1.2 to 1.9 g/cm^3, with the parts by weight of components (E) and (F) in each case being based on 100 parts by weight of the sum of components (A)+(B)+(C) and (D),

said process comprises preparing a (B)/(F) preblend which is a coagulated mixture of emulsions of the tetrafluoroethylene polymers (F) with a ratio of (B) to (F) of from 95:5 to 60:40 with emulsions of additional amounts of graft polymers (B) of 0.1 to 4 parts by weight, rela-

tive to 100 parts by weight of the sum of components (A)+(B)+(C) and (D), and thereafter the components (A), (B), (C), (D), (E), and preblended (F) are mixed and subjected to melt compounding or melt extrusion at a temperature from 200° C. to 330° C.

4,983,659

REACTION INJECTION MOLDING COMPOSITIONS

Herbert R. Gillis, Sterling Heights, Mich., and Malcolm Hannaby, Louvain, Belgium, assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 160,647, Feb. 26, 1988, Pat. No. 4,794,129, which is a continuation-in-part of Ser. No. 105,641, Oct. 6, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,940

Claims priority, application United Kingdom, Mar. 31, 1988, 8807684

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—186 10 Claims

1. An isocyanate-reactive polymeric resin forming composition comprising

(i) a chain extender comprising

(a) 0–100% of an aromatic polyamine having a number-averaged functionality of aromatically bound primary and/or secondary amine groups of from about 1.8 to about 3.0, a number-averaged molecular weight of from about 100 to about 400, and wherein at least 50 mole percent of the species comprising said polyamine are diamines, and, correspondingly,

(b) 100–0% of an imino-functional aliphatic compound having a number-averaged molecular weight less than 1500 and a number-averaged functionality of isocyanate-reactive imino groups of about 1 to about 3, and

(ii) an imino-functional polyether resin having an average of from about 1.1 to about 5 isocyanate-reactive imino groups per molecule and a number-averaged molecular weight of from 1500 to about 10,000, wherein said imino groups constitute at least 50 mole percent of the isocyanate-reactive groups in said polyether resin, and at least 50 mole percent of said imino-functional polyether species contain two or more imino (C=N) groups per molecule.

4,983,660

POLYETHYLENE TEREPHTHALATE RESIN COMPOSITION

Tomohiko Yoshida; Ryoji Handa; Noriyuki Tajiri; Hitochi Iwasaki, all of Toyohashi, and Mituto Yoshihiro, Yokohama, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,131

Claims priority, application Japan, Dec. 25, 1987, 62-331701; Feb. 8, 1988, 63-27282; Mar. 16, 1988, 63-62285

Int. Cl.[5] C08L *67/02;* C08K *3/34, 3/26*

U.S. Cl. 524—369 12 Claims

1. A polyethylene terephthalate resin composition comprising:

(A) 100 parts by weight of a polyethylene terephthalate copolymer comprising ethylene terephthalate units as the main recurring units, said copolymer being formed by copolymerizing a carboxylic acid component containing primarily terephthalic acid with a glycol component containing from 1 to 20% by weight, based on the weight of the copolymer, of a polyalkylene glycol having an average molecular weight of 500 to 20,000 and from 1.2 to 15% by weight, based on the weight of the copolymer, of diethylene glycol;

(B) from 5 to 200 parts by weight of a fibrous reinforcer;

(C) from 0.5 to 130 parts by weight of a nucleating agent; and

(D) from 0.1 to 60 parts by weight of a crystallization-promoting agent.

4,983,661

NON PLATEOUT MOLDING COMPOSITION

Mir L. Ali, Bryan, Ohio; John F. Bateman, Lawrenceville, Ga., and Ming Man, Stow, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Continuation of Ser. No. 299,141, Jan. 20, 1989, abandoned, which is a division of Ser. No. 55,421, May 28, 1987, Pat. No. 4,820,760. This application Feb. 2, 1990, Ser. No. 474,294

Int. Cl.[5] C08K *3/30*

U.S. Cl. 524—423 19 Claims

1. A method for inhibiting plateout on the surface of the mold during the preparation of a molded or shaped article comprising:

(1) intimating blending a composition comprising:

(A) at least one moldable thermoplastic resin selected from the group consisting of ethylene polymers and copolymers, propylene polymers and copolymers, acrylonitrile polymers and copolymers, polymers and copolymers of acrylic acid, methacrylic acid and their esters;

(B) at least one fluorescent pigment; and an effective amount of plateout inhibiting agents comprising:

(C) at least on metal salt or complex selected from the group consisting of metal sulfates, carbonates, silicates, oxides, chromates and mixtures thereof in an amount sufficient to inhibit plateout; and

(D) at least one polymer or oligomer reagent containing a reactive functionality reactive with plateout substances present or produced during the molding process and selected from the group consisting of carboxy and the polyvalent metal salts thereof, hydroxy, epoxy, amino and combinations thereof; and

(2) molding or shaping said composition at the molding or shaping temperature for said thermoplastic resin to form said molded or shaped article.

4,983,662

POLYURETHANE COATING COMPOSITIONS

Gerardus C. Overbeek, Sprang-Capelle, and Martinus P. J. Huets, Echt, both of Netherlands, assignors to ICI Resins b.v., Waalwijk, Netherlands

Filed Mar. 2, 1989, Ser. No. 318,187

Claims priority, application United Kingdom, Mar. 9, 1988, 8805562; Mar. 9, 1988, 8805563; Mar. 9, 1988, 8805564

Int. Cl.[5] C08G *18/04;* C08L *75/12, 75/14*

U.S. Cl. 524—501 21 Claims

1. An aqueous selfcrosslinkable coating composition comprising an aqueous dispersion which comprises at least one polyurethane polymer, wherein said composition has hydrazine (or hydrazone) functional groups and carbonyl functional groups present in the composition to provide a selfcrosslinking reaction, in which said at least one polyurethane polymer takes part, via azomethine formation from the reaction of hydrazine (or hydrazone) functional groups and carbonyl functional groups during and/or after film formation from the aqueous composition.

4,983,663

THERMOPLASTIC RESIN COMPOSITION AND METHOD FOR PREPARING THE SAME

Yuichi Orikasa, Yokohama; Suehiro Sakazume, Fujisawa; Sadahiro Nishimura, Kawasaki, and Yoshinori Maki, Chigasaki, all of Japan, assignors to Nippon Petrochemicals Co. and Nippon Oil & Fats Co., Ltd., both of, Japan

Filed Oct. 28, 1988, Ser. No. 263,723

Claims priority, application Japan, Oct. 30, 1987, 62-276710; Jan. 20, 1988, 63-10499

Int. Cl.[5] C08L *55/02, 67/02, 77/00*

U.S. Cl. 524—504 12 Claims

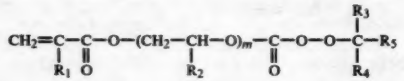
1. A thermoplastic resin composition containing

(I) 99 to 1% by weight of an ABS resin,

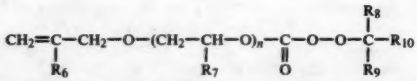
(II) 1 to 99% by weight of at least one kind of resin selected from an aromatic polyester resin and a polyamide resin

(III) 0.1 to 100 parts by weight, based on 100 parts by weight of the aforesaid resins (I)=(II), of a multiphase structure thermoplastic resin which is composed of 5 to 95% by weight of an epoxy group-containing olefin copolymer and 95 to 5% by weight of a vinyl polymer or copolymer obtained from at least one kind of vinyl monomer, the polymer or copolymer being in the state of a dispersion phase having a particle diameter of 0.001 to 10 μm, wherein the multi-phase structure thermoplastic resin is a mixture and/or a grafted compound prepared by melting and mixing the mixture which comprises

1 to 100% by weight of a graft polymerization precursor (A) obtained by copolymerizing at least one vinyl monomer with at least one of radical polymerizable or copolymerizable organic peroxide represented by the following general formulae (a) and (b)



(a)



(b)

wherein R_1 is a hydrogen atom or an alkyl group having 1 to 2 carbon atoms, each of R_2 and R_7 is a hydrogen atom or a methyl group, R_6 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, each of R_3, R_4, R_8 and R_9 is an alkyl group having 1 to 4 carbon atoms, each of R_5 and R_{10} is an alkyl group having 1 to 12 carbon atoms, a phenyl group, an alkyl-substituted phenyl group or a cycloalkyl group having 3 to 12 carbon atoms, m is 1 or 2, and n is 0, 1 or 2 in particles of an epoxy group-containing olefin copolymer,

0 to 99% by weight of an epoxy group-containing olefin copolymer (B), and

0 to 99% by weight of a vinyl polymer or copolymer (C) obtained by polymerizing or copolymerizing at least one vinyl monomer.

4,983,664

INK FOR DIRECTLY PRINTABLE TAPE BEARING RELEASE COATING

Bernard S. Truskolaski, Lake Elmo, and Daniel P. Pohl, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 694,082, Jan. 23, 1985, Pat. No. 4,599,620. This application Dec. 9, 1985, Ser. No. 806,380

Int. Cl.[5] C09D *11/10*

U.S. Cl. 524—514 4 Claims

1. An ink composition comprising a resinous binder comprising a polyamide, a coloring agent, a chlorinated polyolefin, and a solvent, wherein said chlorinated polyolefin comprises from about 3 to about 12 weight percent of said composition.

4,983,665

FLEXIBLE BLEND COMPOSITIONS BASED ON OVERPOLYMERS OF VINYL CHLORIDE POLYMERS ON ETHYLENE COPOLYMERS

Richard H. Backderf, Richfield, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

Continuation of Ser. No. 242,395, Sep. 9, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 443,788

Int. Cl.[5] C08K *31/00;* C08G *63/48*

U.S. Cl. 524—533 25 Claims

1. A flexible blend composition, comprising:

(a) 100 parts by weight of a graft polymer or overpolymer comprising

(1) from about 10 to about 90 percent by weight of the graft polymer or overpolymer of an ethylene copolymer substrate selected from the group consisting of polyethylene or copolymers of ethylene with acrylic esters, methacrylic esters, or vinyl esters wherein said ester substituent has from 1 to about 18 carbon atoms, or monoolefins having from 2 to about 18 carbon atoms, overpolymerized in the sorbed state with

(2) a vinyl chloride monomer and optionally one or more vinyl component comonomers to produce a homopolymer or copolymer in an amount of from about 10 percent to about 90 percent by weight of the graft polymer or overpolymer,

said graft polymer or overpolymer being blended with

(b) from about 20 to about 300 parts by weight of a plasticizer or blending agent based on 100 parts of the overpolymer, said plasticizer or blending agent having a number average molecular weight of equal to or greater than 300 and

wherein said blend composition has an oil swell measured by ASTM D471 using No. 3 oil of from about 0 to about 300 percent at 100° C. for 166 hours.

4,983,666

AQUEOUS DISPERSIONS OF FLUORINATED POLYURETHANES AND THEIR USE FOR TEXTILE COATINGS

Ignazio Zavatteri, Cardano Al Campo, and Tiziana Gambini, Castellanza, both of Italy, assignors to Ausimont S.p.A. & Larac S.p.A., Italy

Continuation of Ser. No. 137,358, Dec. 22, 1987, abandoned. This application Jan. 22, 1990, Ser. No. 467,324

Claims priority, application Italy, Dec. 30, 1986, 22883 A/86

Int. Cl.[5] C04J *3/05*

U.S. Cl. 524—539 13 Claims

1. Stable aqueous dispersions of fluorinated polyurethanes containing in their macromolecules hydrophilic ionic groups, both of anionic and cationic character, obtained by the process comprising the steps:

(a) preparing a fluorinated polyisocyanate, by reaction between an organic diisocyanate and a mixture comprising diols containing ionizable groups and macroglycols comprising polyols and at least 1% by weight of one or more hydroxy- and/or carboxy-capped fluoropolyoxyalkylene ethers;

(b) salifying the so-obtained fluorinated polyisocyanate, to convert the ionizable groups into hydrophilic cations or anions; and

(c) dispersing and chain extending the salified fluorinated polyisocyanate in water.

4,983,667

SPRAYABLE CORK ABLATIVE PROTECTION LAYER

Samuel L. Bagdasarian, Kissimmee, Fla., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 2, 1989, Ser. No. 360,616
Int. Cl.[5] C08L 75/04
U.S. Cl. 524—703 15 Claims

1. A blended mixture for use as a sprayable ablative thermally-insulating coating, said mixture comprising:
a resin,
a filler comprising cork flour, and
a vehicle for maintaining said mixture suitable for spraying.

4,983,668

POLYMER PARTCULATES FOR MOLDING AND THE LIKE

Louis A. Cutter, Allegheny, Pa.; Richard A. Ganger, Carmel Valley, Calif., and John J. Godfrey, Murrysville, Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1987, Ser. No. 125,316
Int. Cl.[5] C08G 63/91; C08L 67/06; C08F 2/20
U.S. Cl. 525—23 21 Claims

1. Method of making polyester resin beads suitable for use as a solid component in a filled molding matrix and having a swelling index of about 1 to about 3, comprising:
(A) preparing an aqueous suspension of (a) unsaturated polyester resin, said resin being a composition comprising (i) about 100 parts by weight of a dibasic acid component comprising from about 5 to about 100 mole percent dibasic acid or anhydride thereof having a polymerizable double bond and up to 95 parts by weight dibasic acid or anhydride not having polymerizable double bonds, and (ii) about 100 to about 120 parts by weight of a glycol or polyol having at least two hydroxyl groups, and (b) about 20 to about 1200 parts per 100 parts of dibasic acid component by weight of a cross-linking monoethylenically unsaturated monomer,
said polyester resin having an acid number in the range of about 5 to about 40 and having an average molecular weight between about 750 and 5000,
said suspension being formed in the presence of an amount of a hydrophilic suspending agent effective to form said suspension;
(B) maintaining the mean droplet size of the resin suspension below about 200 microns by maintaining a pH of greater than 2 but less than 7 and adding an anionic emulsifying agent in an amount up to about 0.3 percent based on the suspension water;
(C) adding to the suspension an effective amount of a polymerization initiator, mixing the suspension, and elevating the temperature of the suspension to begin polymerization of the resin, and
(D) maintaining a pressure on the polymerizing suspension of up to 50 psig until the polymerization reaction is substantially complete.

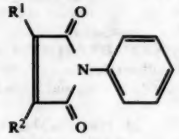
4,983,669

THERMOSETTING COMPOSITION FROM MALEIMIDE, OLEFINIC MONOMER AND UNSATURATED POLYESTER

Virginia Piermattie, and George L. Brownell, both of Pittsburgh, Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 167,674, Mar. 7, 1988, abandoned. This application Mar. 1, 1989, Ser. No. 317,321
Int. Cl.[5] C08G 63/52
U.S. Cl. 525—47 9 Claims

1. A thermosetting composition comprising (a) about 10 to about 60 percent by weight of a polymerizable ethylenically unsaturated monomer selected from vinyl substituted mononuclear aromatic hydrocarbons and halo and alkyl derivatives thereof, alkyl esters of alpha, beta-ethylenically unsaturated monocarboxylic acids and halo derivatives thereof, and allyl esters and ethers, (b) about 1 to about 40 percent by weight of



where R^1 and R^2 are independently selected from hydrogen or C_{1-3} alkyl groups, and in which the phenyl group may be substituted with aliphatic, alicyclic, and aromatic groups and up to three halogen or hydroxyl groups, and (c) about 5% to about 89% by weight unsaturated polyester prepared by polycondensation of polycarboxylic acid derivatives, one of which must be an alpha, beta-ethylenically unsaturated polycarboxylic acid, and polyols.

4,983,670

CELLULOSE ACETATE BOUND PHOTOSENSITIZER FOR PRODUCING SINGLET OXYGEN

Stephen F. Yates, Arlington Heights, Ill.; Mary L. Good, Convent Station, N.J., and Inara M. Brubaker, Des Plaines, Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 20, 1988, Ser. No. 287,318
Int. Cl.[5] C08B 3/00, 5/00, 7/00
U.S. Cl. 525—54.2 20 Claims

1. A cellulose acetate bound photosensitizer comprising an ester which is the reaction product of a hydroxyl group on the cellulose acetate and an ester forming acidic group of the photosensitizer.

4,983,671

TWO COMPONENT POLYURETHANE COATING

Syuhei Numata, Hirakata; Masanori Ohiwa, Toyonaka; Toshihiro Maekawa, Suita; Akio Kashihara, Hirakata, and Tadafumi Miyazono, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jun. 12, 1987, Ser. No. 61,207
Claims priority, application Japan, Jun. 12, 1986, 61-136967; May 25, 1987, 62-127444
Int. Cl.[5] C08L 51/00, 75/06
U.S. Cl. 525—63 3 Claims

1. A two component polyurethane coating consisting of a principal component (A) comprising a hydroxyl group containing film-forming resin selected from the group consisting of an acrylic resin and a polyester resin, crosslinked polymer particles and a solvent for said film-forming resin and a hardener component (B) comprising a polyisocyanate compound, which is characterized by using as the crosslinked polymer particles composite resin particles each comprising a particulate crosslinked polymer core selected from the group consisting of an acrylic resin and a polyester resin and a number of substantially linear polymer chains coupled with said core by way of chemical bonding,
semi-interpenetration or a combination of chemical bonding and semi-interpenetration and containing a metal element in either portion of said core, said polymer chains or both the core and polymer chains, the solid weight ratio of said hydroxyl group containing film-forming resin to said composite resin particles being 99/1 to 40/60 and the equivalent ratio of isocyanate groups in the hardener component (B) to hydroxyl groups in the principal component (A), including the hydroxyl groups in the substantially linear polymer, if present, in addition to the hydroxyl groups in the film forming resin, being 0.5 to 2.0, wherein said substantially linear polymer is selected from the group consisting of an acrylic resin and polyester

resin, and said metal element is selected from the group consisting of Zn, Sn, Al, Fe, Zr, Ti, Ge, Pb, Cr, Mg, Ca, Sr, Li, Na and K.

4,983,672

EPOXIDE RESIN COMPOSITIONS AND METHOD

Carl J. Almer, and William J. Schultz, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1987, Ser. No. 137,453
Int. Cl.[5] C08G *39/24*
U.S. Cl. 525—65 **34 Claims**

1. A method of improving a glass transition temperature and ductility of a cured product from an epoxy resin composition; said method including the step of:

(a) providing in said epoxy resin composition an effective amount of a 9,9-bis(hydroxyphenyl)fluorene composition; said 9,9 bis(hydroxyphenyl)fluorene composition being provided in an amount of between about 0.09 and 0.7 hydroxy equivalents of 9,9-bis(hydroxyphenyl)fluorene composition per equivalent of reactive epoxide group in a polyepoxide component from which said resin composition is formed.

4,983,673

HIGH IMPACT RESISTANT BLENDS OF THERMOPLASTIC POLYAMIDES AND MODIFIED DIBLOCK COPOLYMERS

Carl L. Willis, and Lorelle A. Pottick, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1988, Ser. No. 288,353
Int. Cl.[5] C08L *53/00*
U.S. Cl. 525—92 **53 Claims**

1. A super-toughened multiphase, thermoplastic composition comprising:

(a) one phase containing a thermoplastic α-polyamide; and

(b) at least one other phase containing at least one functionalized, selectively hydrogenated non-network forming block copolymer, each block copolymer molecule comprising at least one hydrogenated conjugated diolefin polymer block and at least one monoalkenyl arene polymer block to which has been grafted on the average an effective amount of carboxyl functional groups for supertoughening the multiphase thermoplastic composition, the functionalized block copolymer molecule having substantially all of the carboxyl functional groups grafted to the monoalkenyl arene polymer block,

(c) the phase containing the α-polyamide being present in a weight ratio of about 50:50 up to about 85:15 relative to the phase containing the block copolymer.

4,983,674

HOT MELT ADHESIVE COMPOSITIONS

Hiromi Shigemoto, Iwakuni; Masami Takeda, Otake, and Tsuneaki Muro, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,456
Claims priority, application Japan, Aug. 11, 1987, 62-200236
Int. Cl.[5] C09J *153/02, 109/06*
U.S. Cl. 525—97 **10 Claims**

1. A hot melt adhesive composition which comprises:

(a) a copolymer of a vinyl aromatic compound and a conjugated dienic compound or a hydrogenated copolymer of a vinyl aromatic compound and a conjugated dienic compound in an amount of about 20–70% by weight;

(b) a tackifier comprising an alicyclic hydrocarbon polymer in an amount of about 30–80% by weight; and

(c) a 4-methylpentene-1 polymer selected from the group consisting of a homopolymer of 4-methylpentene-1 and a copolymer of 4-methylpentene-1 in an amount of about 0.3–20% by weight, based on the composition, respectively, wherein said 4-methylpentene-1 copolymer contains 4-methylpentene-1 in an amount of not less than about 85 mole %.

4,983,675

CROSSLINKED MOLDED PRODUCT

Iwao Ishino; Akihiko Ohno, and Tsutomu Isaka, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 88,388, Aug. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 942,781, Dec. 17, 1986, abandoned, which is a continuation of Ser. No. 826,301, Feb. 5, 1985, Pat. No. 4,689,369. This application Feb. 27, 1989, Ser. No. 316,525
Claims priority, application Japan, Feb. 25, 1985, 60-36004
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—100 **7 Claims**

1. A crosslinked molded product having improved appearance produced by a process which comprises kneaded a mixture comprising

(A) 100 parts by weight a copolymer prepared by radically polymerizing a polymerizable monomeric mixture consisting essentially of ethylene and at least one ethylenically unsaturated silane compound selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane and γ-methacryloxypropyltriethoxysilane in the presence of a radical polymerization initiator and chain transfer agent under pressure ranging from 1,000 to 4,000 kg/cm^2, and containing said silane compound in an amount of from 0.1 to 5 wt. %;

(B) from 0.001 to 10 parts by weight of a catalyst for accelerating condensation between silanol groups of the ethylenically unsaturated silane compound; and

(C) from 0.01 to 5 parts by weight of at least one silane compound having a hydrolyzable organic group selected from the group consisting of n-butyltrimethoxysilane, n-propyltrimethoxysilane, di-n-butyldimethoxysilane, dimethyldimethoxysilane and diethyldimethoxysilane;

extruding the material obtained from the kneading step; and exposing the extruded material to water or moisture.

4,983,676

ISOCYANATE FUNCTIONAL POLYMERS

Brian C. Petrie, Berkeley, Calif.; Thomas W. Druetzler, Lynwood, and Rodney M. Harris, Chicago, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 814,336, Dec. 27, 1985, Pat. No. 4,861,853, which is a continuation-in-part of Ser. No. 609,943, May 14, 1984, abandoned. This application Dec. 30, 1988, Ser. No. 292,614
Int. Cl.[5] C08L *33/14*
U.S. Cl. 525—107 **4 Claims**

1. A two component coating composition which comprises:

(a) a first component which comprises a polymer having active hydrogen functionality reactive with isocyanate groups; and

(b) a second component comprising an isocyanate functional polymer which comprises the saturated, ungelled addition polymerization reaction product of:

(i) 1 to 100% by weight of at least one isocyanate functional ethylenically unsaturated monomer which comprises the reaction product obtained by the gradual addition of an ethylenically unsaturated monomer having a single active hydrogen to a diisocyanate selected from the group consisting of isophorone diisocyanate and 2,4 toluene diisocyanate wherein the final molar ratio of active hydrogen containing monomer to diisocyanate is essentially 1 to 1; and

(ii) 0 to 99% of at least one ethylenically unsaturated monomer which is free of active hydrogen functionality

and which is copolymerizable with the ethylenically unsaturated isocyanate functional monomer.

4,983,677

EXTRUDABLE THERMOPLASTIC HYDROCARBON POLYMER COMPOSITION

Bryce V. Johnson, and Joyce M. Kunde, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 182,466, Apr. 15, 1988, Pat. No. 4,863,983. This application Jul. 18, 1989, Ser. No. 381,364

Int. Cl.[5] C08K *5/52*

U.S. Cl. 525—127 **8 Claims**

1. A processing additive composition suitable for addition to thermoplastic polymers to improve extension characterics consisting essentially of fluorocarbon polymer and organophosphite, organophosphate, or blend thereof such that the weight of said fluorocarbon polymer in said composition and the weight of said organophosphite, organophosphate, or blend thereof in said composition are in a ratio of 1/1 to 1/5, the fluorcarbon polymer and organophosphite, organophosphate or blend thereof, being the predominant component of said processing additive composition and the concentration of said fluorocarbon polymer in said composition is 14 to 50 weight percent, and the concentration of said organophosphite, organophosphate or blend thereof in said composition is 50 to 83 weight percent, where said weight percent is based on total additive composition weight.

4,983,678

CURABLE RUBBER COMPOSITION

Yoshiomi Saito, Yotukaido; Akio Fujino, and Atsumi Ikeda, both of Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,821

Claims priority, application Japan, Jun. 10, 1988, 63-143058

Int. Cl.[5] C08L *9/02, 23/16, 23/26, 33/20*

U.S. Cl. 525—193 **9 Claims**

1. A curable rubber composition comprising (A) 100 parts by weight of a rubber comprising 90 to 60% by weight of an ethylenically unsaturated nitrile/conjugated diene type highly saturated rubber in which the content of conjugated diene is rendered not larger than 30% by weight by hydrogenation and 10 to 40% by weight of an ethylene/propylene copolymer rubber, (B) 10 to 100 parts by weight of a zinc salt of methacrylic acid, and (C) 0.2 to 10 parts by weight of an organic peroxide.

4,983,679

β-(KETO OR SULFONYL)ESTERS FROM REACTION OF SILYLKETENE ACETAL AND ACYL OR SULFONYL COMPOUND

Gordon M. Cohen, Wynnewood, Pa., and Hans J. Reich, Madison, Wis., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 48,958, May 19, 1987, abaadoned, and a continuation-in-part of Ser. No. 8,960, Jan. 30, 1987, abandoned, and a continuation-in-part of Ser. No. 868,083, May 29, 1986, abandoned. This application Apr. 11, 1989, Ser. No. 336,120

Int. Cl.[5] C08F *8/10, 8/36*

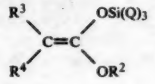
U.S. Cl. 525—194 **21 Claims**

1. Process for preparing beta-ketoesters or beta-sulfonylesters comprising contacting and reacting a silylketene acetal with an acyl or sulfonyl compound in the presence of a catalyst which is a source of,

(1) an anion selected from the group comprising fluoride, difluorotrimethylsilicate, bifluoride, cyanide and azide ions; or

(2) an oxyanion which forms a conjugate acid having a pKa measured in dimethylsulfoxide at 25° C., of about 5 to 24;

the silylketene acetal being of the formula



wherein:

each Q, independently, is selected from —R^1, —OR^1, —$N(R^1)_2$ and —SR^1;

each R^1, independently, is a hydrocarbyl or substituted hydrocarbyl radical;

R^3 is H, hydrocarbyl or substituted hydrocarbyl;

each of R^2 and R^4, independently, is a hydrocarbyl, substituted hydrocarbyl, or a polymeric radical,

the acyl or sulfonyl compound being selected from the group consisting of $[XC(O)]_nR^5$ and $[YS(O)_2]_nR^5$ wherein:

X is a silicon activating group;

Y is —F or —OAr;

Ar is saryl or substituted aryl;

R^5 is a hydrocarbyl, substituted hydrocarbyl or polymeric radical, of valence n, wherein the carbon adjacent to the C(O) or $S(O)_2$ is not part of a carbon-carbon double or triple bond; and

n is an integer of at least 1.

4,983,680

CURED PERFLUOROELASTOMERS AND THEIR PREPARATION

Leo Ojakaar, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 25, 1988, Ser. No. 198,280

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—281 **5 Claims**

1. In a cured perfluoroelastomer composition prepared from polymerized units of tetrafluoroethylene, perfluoro (alkylvinylether) and a nitrile-containing monomer, the improvement wherein the perfluoroelastomer is crosslinked with a carbon-carbon linkage and wherein the cured perfluoroelastomer is substantially free from triazine linkages.

4,983,681

COLORED MICROFINE GLOBULAR PARTICLES, METHOD FOR PRODUCTION THEREOF, AND USES THEREOF

Yoshikuni Mori, Settsu; Mitsuo Kushino, Minoo; Hayato Ikeda, Settsu; Nobuaki Urashima, Takatsuki; Kenji Minami, Suita, and Iwao Fukikawa, Otsu, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 237,772, Jul. 7, 1988, Pat. No. 4,910,113. This application Dec. 22, 1989, Ser. No. 454,946

Claims priority, application Japan, Nov. 10, 1986, 61-265695; Jun. 5, 1987, 62-139664

Int. Cl.[5] C08F *277/00, 279/00*

U.S. Cl. 525—290 **14 Claims**

1. A thermoplastic resin composition, obtained by incorporating in a thermoplastic resin colored microfine globular particles obtained by a process comprising causing carbon black to react with a polymer capable of reacting with said carbon black thereby forming a carbon black-graft polymer, dispersing said carbon black-graft polymer in a polymerizable monomer component, and then polymerizing said polymerizable monomer component.

4,983,682

PROCESS FOR THE MANUFACTURE OF PETROLEUM RESINS SUITABLE FOR THE MANUFACTURE OF PRINTING INKS, VARNISHES AND PAINTS

Paul Badie, Lixing-les-Saint Avold, and Jean-Marie Siebert, Forbach, both of France, assignors to Norsolor S.A., Paris, France

Filed Jun. 5, 1989, Ser. No. 361,069
Claims priority, application France, Jun. 3, 1988, 88 07420
Int. Cl.[5] C08F *279/00*
U.S. Cl. 525—290 **22 Claims**

1. A process for the manufacture of aromatic petroleum resins having a softening point above 120° to 170° C. and soluble in a aliphatic hydrocarbon solvent comprising cationically copolymerizing under polymerization conditions a product comprising a C_6–C_{12} aromatic cut having a minor amount of dicyclopentadiene and a solid resin obtained by the thermal polymerization of a dicyclopentadiene cut having a major amount of dicyclopentadiene, the products being present in a dicyclopentadiene resin/aromatic cut weight ratio of between 0 and 100 to produce said aromatic petroleum resins, and wherein the solid resin obtained by the thermal polymerization of the dicyclopentadiene cut is dissolved in the C_6–C_{12} aromatic cut before the cationic polymerization process.

4,983,683

POLYCYANATE ESTERS OF POLYHYDRIC PHENOLS BLENDED WITH THERMOPLASTIC POLYMERS

David A. Shimp, Prospect, Ky., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Division of Ser. No. 104,686, Oct. 5, 1987, Pat. No. 4,902,752. This application Nov. 6, 1989, Ser. No. 433,020
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[5] C08L *71/12*
U.S. Cl. 525—390 **8 Claims**

1. A process for preparing a cured composition which comprises:

(A) forming a solution of (a) a polycyanate ester of a polyhydric phenol and

(b) an amorphous, aromatic thermoplastic rein,

(B) adding a curing catalyst;

(C) heating the solution at a temperature of about 200° F. to about 350° F. for a time sufficient for phase separation of (a) and (b) to occur and to gel the polycyanate ester, and

(D) curing the gel at a temperature of about 350° F. to about 500° F. for about 30 minutes to about 8 hours, wherein said cured composition has strain energy release rate values in the crack opening mode, G_{IC}, in excess of 1.5 inch-pounds/inch^2.

4,983,684

CROSSLINKABLE RUBBER COMPOSITION

Arthur H. Weinstein, Hudson; Howard A. Colvin, Tallmadge, and Dane K. Parker, Massillon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 27, 1989, Ser. No. 315,987
Int. Cl.[5] C08G *18/06*; C08F *8/32*
U.S. Cl. 525—329.1 **20 Claims**

1. A rubber composition which can be crosslinked by heating which is comprised of (1) at least one dry rubber having pendant blocked isocyanate groups bound thereto; and (2) at least one compound which contains at least 2 Zerewitinoff active hydrogens.

4,983,685

METHODS FOR PRODUCTION OF CROSSLINKED RUBBER PRODUCTS

Masashi Aoshima; Hironobu Shigematu, and Mitsuhiko Sato, all of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 4, 1987, Ser. No. 58,283
Claims priority, application Japan, Jun. 10, 1986, 61-134000
Int. Cl.[5] C08K *5/21, 5/37, 5/39, 5/40*
U.S. Cl. 525—331.8 **13 Claims**

1. A process for producing a crosslinked rubber product by crosslinking a rubber composition with an organic peroxide by continuous vulcanization with the use of a hot air heater, a high frequency heater or a fluidized bed beater, in the presence of aerial oxygen which contacts directly on the surface of the rubber composition and is present in an amount which causes surface tackiness, which comprises incorporating into the rubber composition to prevent tackiness of the surface of the produce at least one compound selected from the group consisting of the following compounds (a)–(h) in an amount of 2.5–20 parts by weight per 100 parts by weight of rubber:

(a) 2-mercaptobenzimidazole, 2-mercaptomethylbenzimidazole, a zinc salt of 2-mercaptobenzimidazole;

(b) thiocarbanilide (N,N'-diphenylthiourea, N,N'-diethylthiourea, ethylenethiourea (2-mercaptomidazoline;

(c) 2-mercaptobenzothiazole, a zinc salt of 2-mercaptobenzothiazole, dibenzothiazyl disulfide;

(d) tetramethylthiuram disulfide, tetraethylthiuram disulfide, dipentamethylenethiuram tetrasulfide;

(e) zinc dibutyldithiocarbamate, nickel dibutyldithiocarbamate;

(f) 2-t-butyl-6-(3'-t-butyl-5'-methyl-2'-hydroxybenzyl)-4-methylphenylacrylate, 2,6-di-t-butyl-4-methylphenol, tetrakis[methylene-3-(3',5'-di-t-butyl-4'-hydroxyphenol)-propionate]methane, 2,2'-methylene-bis(4-methyl-6-t-butylphenol);

(g) benzotriazole, tolyltriazole;

(h) poly-(2,2,4-trimethyl-1,2-dihydroquinoline, N,N'-di-2-naphthyl-p-phenylenediamine, N-phenyl-N'-isopropyl-p-phenylenediamine.

4,983,686

CHEMICAL MODIFICATION OF POLYACRYLAMIDE AND POLYACRYLIC ACIDS/ACRYLAMIDE GELS

Ralph W. Kaesler, Barrington, and Dodd W. Fong, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 14, 1987, Ser. No. 3,349
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.[5] C08F *8/34*
U.S. Cl. 525—351 **2 Claims**

1. A method of preparing an acrylamide terpolymer which contains from 10–95 mole percent of acrylamide, from 1–70 mole percent of acrylic acid and from 1–40 mole percent of an acrylamido C_2–C_3 alkyl sulfonate which comprises:

a. Reacting as the reactants an acrylamide polymers which is in the form of a 10–40 percent weight percent aqueous gel having a water to acrylamide polymer ratio of at least 1 and which contains at least 10 mole percent of acrylamide and from 1–40 mole percent of an amino C_2–C_3 alkyl sulfonate;

b. Heating the reactants to a temperature of at least 130° C. under autogenous pressure for a period of time to produce the acrylamide terpolymer; and then,

c. Recovering the acrylamide terpolymer.

4,983,687

CROSSLINKED CHLORINATED POLYVINYL CHLORIDE RESIN COMPOSITIONS

Dennis L. Lawson, Brunswick, and Robert E. Detterman, Elyria, both of Ohio, assignors to The B.F. Goodrich Company, Brecksville, Ohio

Filed May 23, 1988, Ser. No. 197,730
Int. Cl.[5] C08F 8/22
U.S. Cl. 525—356 **9 Claims**

1. A process for providing a crosslinked chlorinated polyvinyl chloride resin composition, comprising the steps of:

crosslinking a polyvinyl chloride resin during polymerization thereof, with an effective amount of a crosslinking agent so that upon chlorination thereof said chlorinated crosslinked polyvinyl chloride resin has a reduced processing torque of at least 5 percent in compaison to a non-crosslinked chlorinated polyvinyl chloride resin, said crosslinking agent containing two or more polymerizable $CH_2{=}C<$ groups per molecule, and

chlorinating said crosslinked polyvinyl chloride resin so that the amount of chlorine in said chlorinated polyvinyl chloride resin is from about 58 percent to about 70 percent by weight.

4,983,688

LIQUID CRYSTAL POLYMER COMPOSITIONS

Thomas C. Jennings, Gates Mill, and David M. Tanno, Richmond Heights, both of Ohio, assignors to Synthetic Products Company, Cleveland, Ohio

Filed Apr. 28, 1989, Ser. No. 344,595
Int. Cl.[5] C08L 67/04, 67/03, 77/12, 85/00
U.S. Cl. 525—389 **18 Claims**

1. A liquid crystal polymer composition comprising

a liquid crystal polymer and

a polymeric polyvalent metal aromatic polycarboxylate,

said polymeric carboxylate being heat stable at temperatures for processing said liquid crystal polymer, said polymeric carboxylate contained in an effective amount as a reinforcing agent for said liquid crystal polymer.

4,983,689

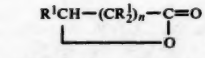
PROCESS FOR MAKING MACROMOLECULAR MONOMERS OF POLYLACTONES WITH TERMINAL ACRYLOYL UNSATURATION AND BLOCK COPOLYMERS THEREOF

Simon H. Yu, Westlake, Ohio

Continuation-in-part of Ser. No. 46,818, May 7, 1987, Pat. No. 4,791,189. This application Dec. 12, 1988, Ser. No. 283,422
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[5] C08G 63/08; C08F 218/02
U.S. Cl. 525—412 **27 Claims**

1. A process for the manufacture of a polylactone macromer having an ethylenically unsaturated functional group near one end and a hydroxyl group at the other, comprising, polymerizing

(A) a cationically ring-openable lactone having the structure:

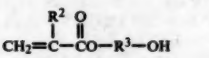


(L)

wherein, n is an integer chosen from 1, 3, 4 and 5;

R^1 is a group selected from hydrogen, C_1–C_{20}alkyl, cycloalkyl, alkoxy and phenyl, and the number of R^1 groups which are H is at least (n+2); and,

(B) an ethylenically unsaturated primary or secondary (meth)acryloyl alcohol wherein the ethylenic unsaturation 3 is adjacent a carbonyl group as in the structure

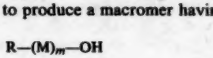


wherein R^2 is H or methyl;

R^3 is selected from the group consisting of branched or linear alkylene, haloalkylene, alkoxyl, haloalkoxyl, each C_1–C_{20}, aralkylene, haloaralkylene, aralkoxyl, and haloaralkoxyl, each C_7–C_{20}; and,

(C) an oxonium salt cationic initiator while maintaining a temperature in the range from about 10° C. to about 80°;

so as to produce a macromer having the structure



(LM)

wherein R represents the residue of said alcohol having a (meth)acryloyl group,

M represents the polyester repeating unit of at least one said lactone which is ring-opened, and,

m represents an integer in the range from 2 to about 500.

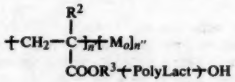
14. The process of claim 1 including the additional step of polymerizing

(a) said macromer (LM) functioning as a comonomer, with

(b) an olefinically unsaturated monomer, in the presence of a sufficient amount for the purpose, of

(c) a free radical polymerization initiator, while maintaining a temperature in the range from about 10° C. to about 80° C.;

to form a random comb-shaped copolymer having the structure



wherein

M_o represents the olefinically unsaturated monomer;

n' represents an integer in the range from 1 to about 10^4, preferably $1–10^3$ and refers to the number of pendant OH-terminated polyester chains; and,

n'' represents an integer in the range from 1 to about 10^5.

4,983,690

CONDUCTIVE POLYMER-MALEIMIDE BLENDS AND METHOD OF PRODUCING SAME

Randy E. Cameron, Pacific Palisades, and Abraham L. Landis, Northridge, both of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Continuation-in-part of Ser. No. 158,478, Feb. 22, 1988, Pat. No. 4,855,361. This application Mar. 20, 1989, Ser. No. 325,724
Int. Cl.[5] C08L 19/08; H01B 1/00
U.S. Cl. 525—436 **32 Claims**

1. The process for producing a conductive polymer blend which comprises:

solution blending in a suitable solvent a mixture of (a) a conductive polymer containing carbon-nitrogen linkages selected from the group consisting of conductive polyaniline, its naphthyl and biphenyl derivatives, and alkyl and aryl substituted polyaniline and its alkyl and aryl substituted naphthyl and biphenyl derivatives, and (b) a maleimide,

removing said solvent, and

forming a conductive continuous phase blend of said conductive polymer and said maleimide.

4,983,691

REDUCTION OF ACIDITY OF POLYESTERS BY MELT REACTION ENDCAPPING WITH DIALKYLOXYLATE OR TETRAALKYL UREA

William L. Hergenrother, Akron, and John M. Doshak, Mogadore, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Aug. 23, 1989, Ser. No. 397,221
Int. Cl.[5] C08F 20/00
U.S. Cl. 525—437 8 Claims

1. A method for reducing the acidity of polyesters which comprises melt reacting a carboxyl group containing polyester having an acid value ranging from 40 to 10 equivalents of CO_2H per 10^6 gm of polyester with an endcapping agent selected from the group consisting of dialkyloxylates and tetraalkylureas in which the alkyl groups are lower alkyl radicals having from 1 to 5 carbons; in an amount ranging from 1 to 50 millimoles per minute for each 100 grams per minute of polyester feed at a temperature in the range of 270° C. to 320° C., thereby effecting endcapping of the carboxyl groups of the polyester to an acid content below 10 milliequivalents of CO_2H per 10^6gm of polyester.

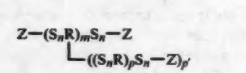
4,983,692

SULFIDE CONTAINING ALIPHATIC EPOXY RESINS

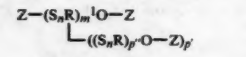
Robert E. Hefner, Jr., and Paul L. Wykowski, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 300,461, Jan. 23, 1989, Pat. No. 4,921,927, which is a division of Ser. No. 234,238, Aug. 19, 1988, Pat. No. 4,829,133, which is a division of Ser. No. 65,533, Jun. 23, 1987, Pat. No. 4,816,546. This application Dec. 12, 1989, Ser. No. 453,429
Int. Cl.[5] C08G 59/02
U.S. Cl. 525—535 4 Claims

1. An epoxy resin composition resulting from dehydrohalogenating the reaction product of one or more polysulfides with an epihalohydrin which polysulfides are represented by the following formulas I or II or a combination of such polysulfides



I.



II.

wherein each R is independently a polyvalent organic radical with each valence residing on a carbon atom and having from one to about 18 carbon atoms: each Z is independently a hydroxyalkyl or inertly substituted hydroxyalkyl monovalent radical having from 1 to about 36 carbon atoms; p and m are independently zero or a positive integer having a value from 1 to about 40; p'' and m[1] are independently a positive integer having a value from 1 to about 40; n is a number from 1 to about 8 and p' is zero or a positive integer which is the difference between the valence of R and two.

4,983,693

PROCESS FOR PREPARING A ZIEGLER TYPE CATALYTIC SYSTEM AND PROCESS FOR PREPARING ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Roberto B. Haag; Jaime C. da Silva, both of Rio de Janeiro; Juan R. Q. Abarca, Petrópolis, and Odyr do Coutto Filho, Rio de Janeiro, all of Brazil, assignors to Petroleo Brasileiro S.A. -Petrobras, Rio de Janeiro and Polialden Petroquimica S.A., Bahia, both of, Brazil

Filed Dec. 29, 1988, Ser. No. 290,481
Claims priority, application Brazil, Dec. 29, 1987, 8707098
Int. Cl.[5] C08F 4/02
U.S. Cl. 526—124 9 Claims

1. A process for preparing ultra high molecular weight polyethylene using a catalytic system in a hydrocarbon solvent which comprises bringing ethylene monomer into contact with the catalytic system in a hydrocarbon solvent and conducting said polymerization for about 1–3 hours in the presence of said catalytic system at a temperature of about 70°–85° C. and a pressure of about 14 kgf/cm^2 of said ethylene monomer wherein said catalytic system is prepared by the following process:

(a) calcining an ammoniacal dawsonite at 600°–800° C. for 4–10 hours, which ammoniacal dawsonite is prepared by the reaction of aluminum sulphate and ammonium bicarbonate at a pH of 7.0 to 8.2, wherein said ammoniacal dawsonite is not washed between said reaction and said calcining, to thereby obtain an alumina with a pore volume of 1.5 to 3.5 cm^3/g, a surface area of 200–400 m^2/g, a residual sulphate ion content of about 10–15% in the calcined alumina and a pore size range in which 85% of the pores are larger than 100 Å;

(b) reacting the resultant alumina with a solution of titanium halide in an aliphatic hydrocarbon at about 80°–140° C., for about one hour, so that the final titanium incorporated in the alumina will be present in an amount of 0.8 to 1.0% by weight to thereby obtain a catalyst composition; and

(c) contacting the catalyst composition obtained in step (b) with a minor amount of an α-olefin under polymerization conditions in order to obtain a pre-polymerized catalyst which contains from 500 to 1000 wt % of the pre-polymerized α-olefin based on the weight of the supported catalyst;

(d) adding a co-catalyst to the product of step (c), which co-catalyst is triethylaluminum or triisobutylaluminum in an amount sufficient to provide an Al/Ti molar ratio between 2.5/1 and 80.0/1, and wherein the halide/Ti ratio in the catalytic system is about 3.0/1.

4,983,694

PROCESS FOR POLYMERIZING OLEFINS TO FORM POLYMERS OF NARROW MOLECULAR WEIGHT DISTRIBUTION

Allan B. Furtek, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 200,403, May 31, 1988, Pat. No. 4,876,229. This application Sep. 8, 1989, Ser. No. 404,482
Int. Cl.[5] C08F 4/02, 5/643
U.S. Cl. 526—125 39 Claims

1. A process of polymerizing at least one alpha-olefin to produce polymers having melt flow ratio (MFR) values of about 25 to about 50 comprising contacting the alpha-olefin with a supported catalyst composition having an average pore diameter of about 20 to about 300 Angstroms (Å) at a substantially constant particle size, so that the span of the particle size distribution of the catalyst is less than about 0.5, the catalyst composition comprising a transition metal, or a compound thereof, and a catalyst activator.

4,983,695

MOLECULAR WEIGHT CONTROL OF POLYBUTADIENE

Leonard J. Kuzma, Copley, and Kenneth F. Castner, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 902,249, Aug. 29, 1986, abandoned, which is a continuation of Ser. No. 371,842, Apr. 26, 1982, abandoned. This application Jan. 8, 1990, Ser. No. 461,949
Int. Cl.[5] C08F 2/40, 36/06
U.S. Cl. 526—142 10 Claims

1. A process for regulating the molecular weight of a high cis-1,4-polybutadiene prepared by polymerizing 1,3-butadiene in a solution of an aliphatic and/or cycloaliphatic solvent system employing as a catalyst system, a mixture of (1) a nickel salt of a carboxylic acid, (2) a trialkylaluminum compound, and

(3) a fluorine containing compound prepared by complexing hydrogen fluoride with ethers; wherein the mole ratio of said trialkylaluminum compound to said nickel salt of a carboxylic acid ranges from about 0.3/1 to about 300/1, wherein the mole ratio of said fluorine containing compound to said nickel salt of a carboxylic acid ranges from about 0.5/1 to about 500/1, and wherein the mole ratio of the fluorine containing compound to the trialkylaluminum compound ranges from about 0.4/1 to about 15/1; said polymerization being conducted in the presence of 0.73 to 4.57 phm of propylene.

4,983,696

PROCESS FOR PRODUCING POLYACETYLENE

Mamoru Soga, Osaka; Shu Hotta, Kawasaki, and Nobuo Sonoda, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 16, 1990, Ser. No. 465,421

Claims priority, application Japan, Jan. 25, 1989, 1-015406; Apr. 10, 1989, 1-090175

Int. Cl.[5] C08F *138/02*

U.S. Cl. 526—159 1 Claim

1. A process for producing a polyacetylene by polymerizing acetylene with a Ziegler-Natta catalyst consisting of a tetraalkyl titanate and a trialkylaluminum, wherein the Ziegler-Natta catalyst at least one of the tetraalkyl titanate and the trialkylaluminum has a long chain alkyl group having 6–10 carbon atoms and the molar ratio of Al to Ti is 1.5–10.

4,983,697

PREPARATION OF CYANO-CONTAINING PERFLUOROPOLYMERS HAVING IODINE CURESITES

Anestis L. Logothetis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 19, 1989, Ser. No. 354,195

Int. Cl.[5] C08F *14/18, 14/26*

U.S. Cl. 526—206 12 Claims

1. In a process for the preparation of perfluoropolymer by the random copolymerization of tetrafluoroethylene, perfluoro (alkyl vinyl) ether and fluorinated curesite monomer containing nitrile groups, the improvement wherein the copolymerization reactants further comprise iodo-compounds of the formula RI_n, in which R is a hydrocarbon or halocarbon radical of 1 to 8 carbon atoms and n is 1 or 2.

4,983,698

CATIONIC POLYMERS

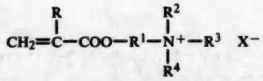
Peter M. Robinson, Columbus, and Nguyen Van-Det, Midland, both of Ga., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 137,073, Dec. 23, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 277,715

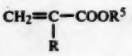
Int. Cl.[5] C08F *2/32, 2/16*

U.S. Cl. 526—207 26 Claims

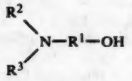
1. In the preparation of a water-soluble cationic copolymer comprising (i) a nonionic monomer selected from acrylamide and methacrylamide and (ii) a cationic monomer of the formula



wherein R is hydrogen or methyl, R^1 is alkylene C_2–C_4, R^2–R^4 are each individually alkyl C_1–C_4, and X is a counterion, the improvement which comprises replacing a portion of the nonionic monomer with an azeotropic waste stream which is produced and removed during a transesterification reaction between a starting acrylate of the formula



wherein R^5 is alkyl C_1–C_3, and a starting dialkylamino alcohol of the formula



which was used to prepare the cationic monomer, wherein the waste stream is utilized in a totally different reaction from that in which it was produced.

4,983,699

SILYLATED ADDITION POLYMERS WITH PENDANT IONIC MOIETIES

David E. Dana, Pittsburgh; Ernest L. Lawton, Allison Park, both of Pa., and George L. Brodmann, Charlottesville, Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 292,859

Int. Cl.[5] C08F *30/04*

U.S. Cl. 526—240 19 Claims

1. An addition polymeric reaction product comprising:

a. at least one ethylenically unsaturated monomer having an ionic moiety selected from the group consisting of sulfonates and quaternary ammonium salts that makes the monomer water emulsifiable in an effective amount to give an amount of the reacted monomer in the polymer for at least water dispersibility of the polymer,

b. a copolymerizable organo-functional silane compound having ethylenic unsaturation for copolymerization in the organo-functional group and having associated with the silane three groups selected from alkoxy, hydroxy, and mixtures thereof, where the silane compound is present in an effective amount to give an amount of free-radically reacted or pendant silane in the range of about 1 to about 15 weight percent of the interpolymer, where the addition polymer is formed in the presence of a free-radical initiation catalyst in an effective catalytic amount and of at least one liquid carrier at an elevated temperature in a nonoxidizing atmosphere, wherein the addition polymer has pendant ionic moieties and pendant silane moieties that have groups selected from the group consisting of hydrolyzable, hydrolyzed and partially hydrolyzed groups.

4,983,700

CURABLE POLYMER COMPOSITION

Sadao Yukimoto; Toshifumi Hirose; Hiroshi Wakabayashi, and Katsuhiko Isayama, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry, Co. Ltd., Osaka, Japan

Filed Jun. 9, 1989, Ser. No. 363,855

Claims priority, application Japan, Jun. 10, 1988, 63-144015

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—34 10 Claims

1. A curable polymer composition comprising: (A) 100 parts by weight of an oxyalkylene base polymer having bonded to the backbone at least one silicon-containing group of the formula (I)

(I)

wherein R_2 is a substituted or unsubstituted C_1–C_{40} organic group;

X is a hydroxyl group or a hydrolyzable group;

a is 0, 1 or 2;

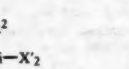
b is 0, 1, 2 or 3; and

m is an integer of 0 to 19,

provided that when two or more R^2 groups are present, they may be the same or different, that when two or more X' substituents are present, they may be the same or different, that the sum of a and b is not less than one, that when m is not less than 2, the kinds of the repeating units in the brackets may be the same or different,

(B) 0.1 to 20 parts by weight of at least one compound selected from the group consisting of a compound of the formula $(R^3)_3SiOH$ and a compound which, when reacted with moisture, generates a compound $(R^3)_3SiOH$, wherein the R^3 groups are the same or different and are substituted or unsubstituted alkyl group having 1 to 20 carbon atoms or a substituted or unsubstituted aryl group having 6 to 20 carbon atoms,

(C) 0.1 to 20 parts by weight of a compound having a silicon-containing



wherein R^2 is defined as above and X' is a hydrolyzable group, and

(D) 0.01 to 5 parts by weight of a compound having a silicon-containing group SiX_3' and an amino group, wherein X' is a hydrolyzable group.

4,983,701

SILICONE COMPOSITION FOR RENDERING SURFACES NON-ADHERENT

Yasuaki Hara; Masahiko Ogawa, and Meguru Kashida, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd, Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,179

Claims priority, application Japan, Feb. 26, 1988, 63-45448

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **16 Claims**

1. In an organopolysiloxane composition which in the presence of a platinum-containing curing catalyst is curable to a release agent for rendering surfaces non-adherent, the improvement wherein said organopolysiloxane comprises a first organopolysiloxane containing at least two silicon-bonded unsaturated groups per molecule, a second organopolysiloxane containing at least two silicon-bonded atoms per molecule, and a third organopolysiloxane containing a single Si—H bond positioned at one end of the molecule.

4,983,702

CROSSLINKED SILOXANE-URETHANE POLYMER CONTACT LENS

Karl F. Mueller, New York, and Paul Harisiades, Woodhaven, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,200

Int. Cl.[5] C08G *77/388*

U.S. Cl. 528—28 **8 Claims**

1. A crosslinked siloxane-urethane polymer in form of an ophthalmic device, which consists essentially of the reaction product of:

(A) a di- or poly-hydroxyalkyl substituted alkyl polysiloxane having a number average molecular weight between about 200 and about 10,000, and

(B) an aliphatic, cycloaliphatic or aromatic di- or tri-isocyanate;

wherein the total number of hydroxyl groups in component (A) is stoichiometrically equivalent to the total number of isocyanate groups in component (B), and with the proviso that an effective crosslinking amount of (A) or (B) or both (A) and (B) is present and possesses a functionality greater than two.

4,983,703

COATING COMPOSITION WITH EXTENDED POT LIFE

Dieter Moller, and Udo Vorbeck, both of Ascheberg, Fed. Rep. of Germany, assignors to BASF Lacke & Farben Aktiengesellschaft, Münster, Fed. Rep. of Germany

PCT No. PCT/EP87/00721, § 371 Date Jul. 6, 1989, § 102(e) Date Jul. 6, 1989

PCT Filed Nov. 20, 1987, Ser. No. 364,427

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639637

Int. Cl.[5] C08G *18/30*

U.S. Cl. 528—49 **18 Claims**

1. A coating composition containing an organic solvent, a mixture of a polyhydroxy component (A) and a polyisocyanate component (B), and a pot life extender, wherein the polyhydroxy component has an acid value of 5 to 25 mg of KOH/g, and a mixture consisting of 0.1 to 4.0% by weight, based on the total weight of the coating composition, of a compound having a tertiary amino group or an amide group (C), and of 1 to 15% by weight, based on the total weight of the coating composition, of a tertiary monoalcohol (D) is used as pot life extender, 2-methyl-2-propanol and 2-methyl-2-butanol being excluded as the tertiary alcohol.

4,983,704

HEAT-REACTIVE CROSSLINKING AGENT FOR SURFACE COATING BINDERS

Dirk Lawrenz, Ditzingen; Hans Schupp, Worms; Thomas Schwerzel, Ludwigshafen; Hans-Josef Oslowski, and Ulrich Heimann, both of Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 12, 1989, Ser. No. 378,795

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824416

Int. Cl.[5] C08G *18/54*

U.S. Cl. 528—69 **9 Claims**

1. A heat-reactive crosslinking agent for surface coating binders which is based on a phenolic Mannich base, obtainable by reacting

(A) one equivalent of a polyphenol with

(B) from 0.5 to 2 equivalents of formaldehyde or of a formaldehyde-donating compound and

(C) from 0.5 to 1 equivalent of one or more secondary aliphatic amines,

removing the water of reaction and reacting the resulting reaction product with

(D) from 0.01 to 1 equivalent of one or more compounds selected from the group consisting of the mono- and polyfunctional isocyanates.

4,983,705

THERMOPLASTIC ELASTOMERIC POLYIMIDE LINKED BY OLIGOMERIC THIO CHAIN

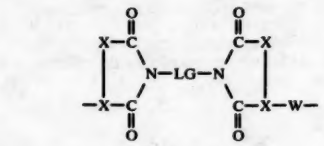
Charles M. Lewis, Springfield, Mo., and Nasser Pourahmady, Avon Lake, Ohio, assignors to Dayco Products, Inc., Dayton, Ohio

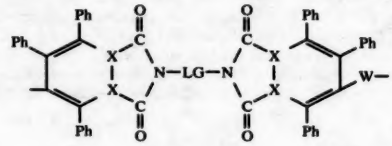
Filed Jan. 17, 1989, Ser. No. 297,217

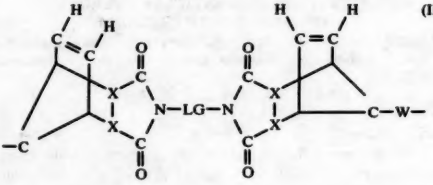
Int. Cl.[5] C08G *73/10*

U.S. Cl. 528—170 **8 Claims**

1. A thermoplastic polymer having a repeating unit of the formula (I), (II), or (III):


(I)


(II)


(III)

where LG is a linking group, X is a carbon atom or a nitrogen atom and W is represented by the formula:

—S—W'—S—

where W' is a straight or branched chain polyether, polythioether, or polyetherthioether chain.

4,983,706

INTERFACIAL PROCESS COMPRISING REACTING A DIHYDRIC PHENOL, A CARBONATE PRECURSOR AND AN ALIPHATIC ALPHA OMEGA DICARBOXYLIC SALT

Luca P. Fontana, Evansville, Paul W. Buckley, Mt. Vernon; Denise Y. Harris, Evansville, all of Ind., and Eugene P. Boden, Scotia, N.Y., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 30, 1990, Ser. No. 476,066

Int. Cl.[5] C08G *8/02, 63/02, 63/62*

U.S. Cl. 528—176 **10 Claims**

1. A process which comprises reacting interfacially a dihydric phenol, a carbonate precursor and a prior prepared salt of an aliphatic alpha omega dicarboxylic acid having from 8 to about 20 carbon atoms thereby producing a copolyestercarbonate.

4,983,707

COPOLYESTER FROM 1,6-BIS(PHENOXY)HEXANE-4,4'-DICARBOXYLATE

Hiroka Tanisake; Koji Yamamoto; Toshizumi Hirota, and Kazunobu Maruo, all of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 31, 1990, Ser. No. 473,153

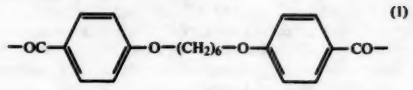
Claims priority, application Japan, Feb. 8, 1989, 1-27478

Int. Cl.[5] C08G *63/02, 63/18*

U.S. Cl. 528—193 **6 Claims**

1. A melt-processable copolyester comprising:

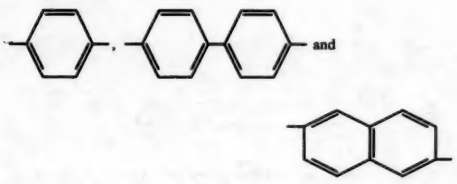
a recurring structural unit (I) of the following formula (1),


(1)

a recurring structural unit (II) of the following formula (2),

—OC—X—CO— (2)

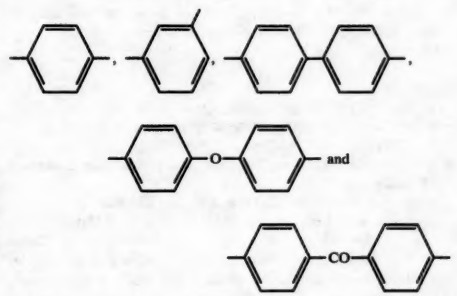
wherein X is at least one member selected from the group consisting of


and

a recurring structural unit (III) of the following formula (3)

—O—Y—O— (3)

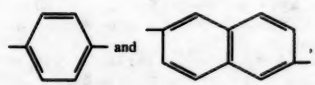
wherein Y is at least one member selected from the group consisting of


and

a recurring structural unit (IV) of the following formula (4)

—O—Z—CO— (4)

wherein Z represents at least one member selected from the group consisting of


and

the ratio of the recurring structural unit (III) to the recurring structural units [(I)+(II)+(III)+(IV)] in total being 5 to 80 mole % the recurring structural units [(I)+(II)] being substantially equimolar to the recurring structural unit (III), the ratio of the recurring structural unit (I) to the recurring structural units [(I)+(II)] in total being 10 to 90 mole %, and the copolyester having an inherent viscosity (ln η_{rel})/C, measured in a concentration of 0.16g/dl in pentafluorophenol at 60° C., of not less than 0.3 dl/g.

4,983,708

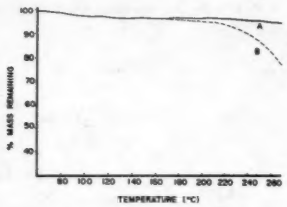
NOVEL POLYACETAL COPOLYMERS OF TRIOXANE AND GLYCIDYL ESTER DERIVATIVES

Nan L. Yang, Staten Island, N.Y.; Andrew Auerbach, Livingston, N.J.; Rose. Pesce, College Point, N.Y.; Jerry A. Broussard, and James L. Paul, both of Summit, N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

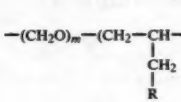
Filed May 12, 1989, Ser. No. 350,782

Int. Cl.[5] C08G *4/00*

U.S. Cl. 528—230 19 Claims



1. An acetal copolymer comprised of repeating units of the formula:



where R is an ester radical, m and n are each integers such that m+n is between 5 to 20000, and the mole ratio of units of subscript n to the units of subscript m is between about 1:5000 5000 to 1.1.

4,983,709

AROMATIC COMPOUNDS CONTAINING CYANATE ESTER AND PROPARGYL ETHER GROUPS

Roy J. Jackson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 2, 1988, Ser. No. 279,383

Int. Cl.[5] C08G *65/38, 73/00;* C07C *255/00;* B32B *27/00*

U.S. Cl. 528—230 35 Claims

1. A aromatic compound having at least one cyanate ester and at least one propargyl ether group each independently directly attached to ring carbon atoms of an aromatic organic group which contains from about 6 to about 100 carbon atoms.

4,983,710

METHOD FOR PRODUCTION OF METHYLOLAMINOTRIAZINE CONDENSATES BASED ON CYCLOHEXANECARBOGUANAMINE

Hidetaka Yatagai, Nishinomiya; Jiro Iriguchi, Takatsuki; Souichi Yamada, Kyoto, and Tsuguo Takaya, Otsu, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 195,153, May 18, 1988, abandoned. This application Aug. 10, 1989, Ser. No. 391,956

Claims priority, application Japan, May 20, 1987, 62-121338; Jul. 30, 1987, 62-188992; Oct. 30, 1987, 62-273271

Int. Cl.[5] C08G *12/30*

U.S. Cl. 528—258 4 Claims

1. A method for the production of a homogenous and clear methylolaminotriazine condensate by the reaction of cyclohexanecarboguanamine (A) and formaldehyde (B), which method comprises:

preparing a solution of formaldehyde (B) or a solution containing cyclohexanecarboguanamine (A) and formaldehyde (B) in such amounts that the molar ratio (A)/(B) will be not more than about 1/2.5;

heating the solution and maintaining the temperature of the solution between about 80° and about 150° C. and;

supplying cyclohexanecarboguanamine to the solution at a rate defined by the formula:

$$Y \geqq 100(1X - \tfrac{1}{2})$$

wherein X is the number of moles of formaldehyde to be used per mole of cyclohexanecarboguanamine, said number of moles of formaldehyde being from about 1.8 to less than about 3, and Y is the time in minutes during which said cyclohexanecarboguanamine is added to the solution after the temperature of said solution reaches about 80° C.

4,983,711

COPOLYESTERS AND ARTICLES EXTRUSION BLOW-MOLDED THEREFROM

Bobby J. Sublett, and Randy S. Beavers, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,062

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 9 Claims

1. A copolyester having an inherent viscosity of about 0.5 to 1.0 and an ASTM D3835 melt strength percent of at least about 10 comprised of:

A. diacid residues comprising terephthalic acid residues;

B. diol residues comprising about 25 to 75 mole percent ethylene glycol residues and about 25 to 75 mole percent 1,4-cyclohexanedimethanol residues; and

C. about 0.05 to 1.0 mole percent of the residue of a trifunctional monomer.

4,983,712

POLYESTERS CONTAINING ACRYLOYL GROUPS AND A PROCESS FOR THEIR PRODUCTION

Jügen Meixner, Krefeld, and Wolfgang Fischer, Meerbusch, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 549,572

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922875

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 2 Claims

1. A polyester which contains one or more acryloyl groups, has a viscosity at 23° C. of 2,000 to 20,000 mPa.s and an acid value of 0 to 25, and is based on the esterification product of

(I) a dicarboxylic acid component comprising

(A) 20 to 70 mole percent of terephthalic acid,

(B) 30 to 80 mole percent of adipic acid and,

(C) 0 to 30 mole percent of at least one aromatic, saturated aliphatic or saturated cycloaliphatic dicarboxylic acid, other than terephthalic or adipic acid, having a molecular weight of 100 to 202 or an anhydride of such dicarboxylic acid,

(II) at least 1.5 moles, based on one mole of said dicarboxylic acid component, of a polyol component comprising

(D) 0.4 to 1.5 moles of at least one dihydric, saturated C_{2-6} alcohol and

(E) 0.4 to 1.1 moles of at least one trihydric, saturated alcohol containing ether groups and obtained by the addition of 3 to 6 moles of ethylene oxide onto 1 mole of a trihydric, saturated alcohol containing ether groups and having a molecular weight of 92 to 134 and

(III) an unsaturated acid component comprising, based on one mole of said dicarboxylic acid component,

(F) 1.0 to 2.0 moles of acrylic acid,

wherein the sum of the hydroxyl equivalents of components (D) and (E) is greater than or equal to the sum of the carboxyl equivalents of components (A), (B), (C) and (F).

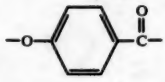
4,983,713

POLYESTER RESIN EXHIBITING OPTICAL ANISOTROPY IN MOLTEN STATE CONTAINING MINOR AMOUNTS OF 6-OXY-2-NAPHTHOYL UNITS

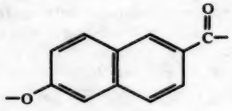
Noriyuki Hayashi; Yukihiko Kageyama, and Kenji Hijikata, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jul. 3, 1989, Ser. No. 374,750
Claims priority, application Japan, Jul. 5, 1988, 63-167160
Int. Cl.[5] C08G 63/02, 63/18, 63/00, 67/00
U.S. Cl. 528—190 10 Claims

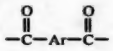
1. A polyester resin exhibiting optical anisotropy in a molten state which comprises constituent units represented by the following formulas (I) to (IV) wherein the concentrations of the units (I), (II), (III) and (IV) are 50 to 85 mole percent, 0.5 to 2.8 mole percent, 0.5 to 30 mole percent and 0.5 to 30 mole percent respectively, based on the total amount of the constituent units:



(I)



(II)



(III)

wherein Ar is a divalent group having at least one aromatic ring,

(IV)

wherein Ar' is a divalent group having at least two aromatic rings.

4,983,714

HALOGEN-CONTAINING POLYESTER RESIN COMPOSITION AND COVERED WIRE

Toshio Nakane, Fuji; Yukihiko Kageyama, Fujinomiya; Hiroaki Konuma, Shimizu, and Kenji Hijikata, Mishima, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Dec. 28, 1988, Ser. No. 291,265
Claims priority, application Japan, Dec. 28, 1987, 62-335856
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 12 Claims

1. A halogen-containing polyester resin composition consisting essential[illegible] of:

(A) a flame retardant aromatic polymer copolymer having a halogen content of 0.5 to 30 wt. % and prepared by polycondensation of:

(a) a component comprising mainly of an aromatic dicarboxylic acid or an ester forming derivative thereof:

(b) a component comprising mainly of an aliphatic glycol or an ester forming derivative thereof, and

(c) a component comprising an ester forming compound containing a halogen; and, incorporated therein,

(B) a bisepoxy compound in an amount of 0.1 to 10% by weight based on the total amount of the composition.

4,983,715

CURABLE COMPOSITION

Hiroshi Miwa, Itami; Yoshitaka Okude, Hirakata; Katsumi Mizuguchi, Suita, and Hidefumi Okuda, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 7, 1989, Ser. No. 334,549
Claims priority, application Japan, Apr. 8, 1988, 63-87557; May 12, 1988, 63-117775
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 13 Claims

1. A curable composition which comprises:

(A) a compound having a carboxylic anhydride group,

(B) a polyfuncational amine compound, a polyfunctional hydroxyl group-containing compound, a compound having both an amino group and a hydroxyl group or a compound latently having an amino group and/or a hydroxyl group, and

(C) a metal chelate compound or metal alcoholate compound (C) being present in an amount of 0.3 to 3.0 equivalents in terms of metal based on one equivalent of said carboxylic anhydride group of the component (A).

4,983,716

NON-AQUEOUS DISPERSIONS

Madhukar Rao, Brecksville; Richard F. Tomko, North Olmsted, and Daniel R. Sayre, Lowellville, all of Ohio, assignors to The Sherwin-Williams Company

Filed Jan. 16, 1990, Ser. No. 464,841
Int. Cl.[5] C08C 63/02
U.S. Cl. 528—272 33 Claims

1. A process for producing an alkyd having a non-volatile materials content greater than about 75%, a volatile organic content less than about 305 g/l, and a molecular weight, M_n, greater than about 20,000, comprising:

(a) first, reacting a triglyceride oil with a trifunctional carboxylic acid or trifunctional carboxylic anhydride, and

(b) second, reacting the intermediate of step a) with a trifunctional alcohol or a mixture of tri- and di- functional alcohols;

under reaction conditions such that the molar ratio of triglyceride oil to trifunctional carboxylic acid or anhydride is from about 1:1 to about 1.75:1 and the molar ratio of trifunctional alcohol to trifunctional carboxylic acid or anhydride is from about 1:1 to about 1.5:1.

4,983,717

MEMBRANE FILTER MATERIAL HAVING EXCELLENT ORGANIC SOLVENT RESISTANCE, METHOD FOR FORMATION OF MEMBRANE FILTER AND PROCESS FOR PREPARATION OF BISMALEIMIDE POLYMER TO BE USED FOR MEMBRANE FILTER

Kazuyuki Yamasaki, Chiba; Kimio Yamamoto, Ichihara; Masanobu Watanabe, Ichihara; Kojiro Kan, Ichihara, and Yoshio Nakayama, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,976
Claims priority, application Japan, Aug. 23, 1988, 63-207243; Aug. 23, 1988, 63-207244; Sep. 22, 1988, 63-238448
Int. Cl.[5] C08G 73/10
U.S. Cl. 528—317 6 Claims

1. A process for the preparation of a bismaleimide polymer having an excellent organic solvent resistance, which comprises reacting a bismaleimide compound with a perhydrodiaza-type heterocyclic compound in a halogen-containing organic solvent in the copresence of a small amount of a phenol.

4,983,718

COLOR MINIMIZATION DURING MELT PREPARATION OF POLYAMIDES WITH HYPOPHOSPHORUS ACID

Kenneth P. Blackmon, Houston, Tex.; Donald C. Clagett, and Sheldon J. Shafer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 9, 1989, Ser. No. 364,360
Int. Cl.[5] C08G *69/28*
U.S. Cl. 528—336 17 Claims

1. A process for the preparation of a polyamide, said process comprising heating a mixture of a least one diaryl ester of a dicarboxylic acid having at least 6 carbon atoms and at least one diamine having at least 4 carbon atoms, at a temperature above the melting point of said polyamide until formation of said polyamide is substantially complete, said process including the step of adding an amount of hypophorous acid to said mixture in an amount selected from between from 0.1 weight percent and 0.5 weight percent based on the total weight of said mixture, said diamine being selected from the group consisting of 1,4-tetramethylene diamine, 1,6-hexamethylene diamine, 1,12-diaminodecane, bis(4-aminocyclohexyl)methane, meta xylylenediamine, 2-methyl pentamethylene diamine, and 1,3-cyclohexane bis(methylamine), and mixtures thereof.

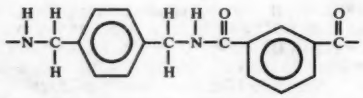
4,983,719

AMORPHOUS POLYAMIDE HAVING EXCELLENT OXYGEN BARRIER PROPERTIES FROM PARA-XYLYLENE DIAMINE, ISOPHTHALIC ACID AND ADIPIC ACID

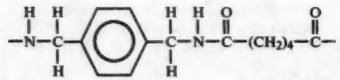
Daniel W. Fox, Pittsfield; Edward N. Peters, Lenox, both of Mass.; Geoffrey H. Riding, Castleton, N.Y., and G. Fred Willard, Dalton, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jul. 21, 1989, Ser. No. 383,841
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—339 14 Claims

1. A polyamide consisting of first moieties having a formula of:



, and second moieties having a formula of:



said first moieties being present in said polyamide at a level of from 80 mole % to 40 mole % based on the total moles of first moieties and second moieties in said polyamide, said second moieties being present at a level of 20 mole % to about 60 mole % based on the total moles of first moieties and second moieties in said polyamide.

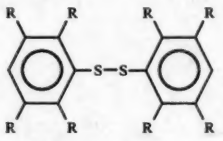
4,983,720

PROCESS FOR PREPARING A POLYARYLENE THIOETHER

Eishun Tsuchida, Seki; Hiroyuki Nishide, Tokyo; Kimihisa Yamamoto, Hon, and Shu Yoshida, Narashino, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 160,936, Feb. 26, 1988, Pat. No. 4,931,542.
This application Sep. 19, 1989, Ser. No. 409,351
Claims priority, application Japan, Feb. 28, 1987, 62-46075; Feb. 28, 1987, 62-46076; Mar. 28, 1987, 62-75254
Int. Cl.[5] C08G *75/02*
U.S. Cl. 528—373 4 Claims

1. A process for preparing a polyarylene thioether which comprises electrolytically polymerizing a diphenyldisulfide represented by the following formula



wherein each R group may be the same or different and is a substituent selected from the group consisting of a hydrogen atom, a lower alkyl group, a halogen atom and a lower alkoxy group, in the presence of an acid selected from the group consisting of a Lewis acid and a proton acid.

4,983,721

SOLVENTS FOR COLLAGEN

Peter F. Davison, Lexington, Mass., assignor to Boston Biomedical Research Institute, Boston, Mass.

Filed Nov. 25, 1988, Ser. No. 276,285
Int. Cl.[5] A61K *37/12;* C07K *15/20;* C08H *1/06*
U.S. Cl. 530—356 22 Claims

1. A method for extracting collagen from animal collagen-containing tissue, comprising:

contacting the tissue with a solution of an organic amine salt, under conditions whereby collagen is extracted from animal collagen containing tissue, and said organic amine being selected from the group consisting of diamines and aminoalcohols, and

recovering collagen extracted from animal collagen-containing tissue into said organic amine salt solution.

4,983,722

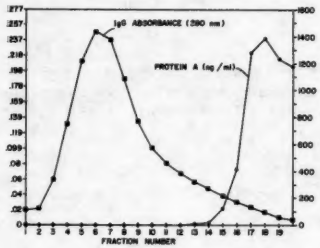
REMOVAL OF PROTEIN A FROM ANTIBODY PREPARATIONS

James W. Bloom, Richmond; Melvin F. Wong, San Francisco, and Gautam Mitra, Kensington, all of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed Jun. 8, 1988, Ser. No. 204,054
Int. Cl.[5] C07K *3/22, 3/18*
U.S. Cl. 530—387 5 Claims

1. A method of reducing the amount of protein A from a mixture of antibodies and protein A to less than about 15 ng of protein A per mg of antibodies, the method comprising the

steps of contacting the mixture with an anion exchange material under conditions sufficient to adsorb both the antibodies



and the protein A and then sequentially eluting the antibodies and Protein A under conditions of increasing ionic strength.

4,983,723

CYCLOALKANE DERIVATIVES

Hitoshi Yasuda; Chikara Fukaya; Kanemichi Okano, and Kazumasa Yokoyama, all of Osaka, Japan, assignors to Green Cross Corporation, Osaka, Japan

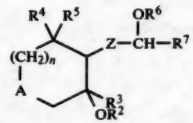
Filed Dec. 7, 1987, Ser. No. 129,217

Claims priority, application Japan, Dec. 5, 1986, 61-290785; Dec. 5, 1986, 61-290786

Int. Cl.[5] A61K *31/00*; C07C *13/00*

U.S. Cl. 536—4.100 **6 Claims**

1. A cycloalkane derivative represented by formula (I):



(I)

wherein A represents a methylene group, >CH—O—R^8, or a carbonyl group; R^2, R^6, and R^8 each represents a hydrogen atom or an organic residual group; R^3, R^4, and R^5 each represents a hydrogen atom or a substituted or unsubstituted alkyl group; R^7 represents a substituted or unsubstituted alkyl group; Z represents an ethynylene group (—C≡C—), a vinylene group, an ethylene group, or =C=CH—; and n=0 or 1, except that the cycloalkane is not represented by the case where R^2 and R^6 each represents a hydrogen atom, R^3, R^4, R^5, and R^7 each represents a methyl group, Z represents =C=CH— and n represents 1.

4. The cycloalkane derivative as claimed in claim 1, wherein said organic residual group for R^2, R^6 R^8 is selected from the group consisting of an alkyl group, an acyl group, an alkoxycarbonyl group, an alkoxycarboxylalkyl group, a carbonylalkyl group, a carboxyalkylcarbonyl group, a cyclic acetal group and an oligosaccharide residue having 1 to 3 sugar units.

4,983,724

INVERSION OF 2,2-DIFLUORORIBOSE TO A 2,2-DIFLUOROXYLOSE AND INTERMEDIATES THEREFOR

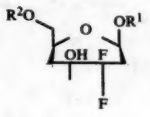
Larry W. Hertel, and Marie T. Reamer, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 295,321, Jan. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 156,116, Feb. 16, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 394,394

Int. Cl.[5] C07H *1/00*

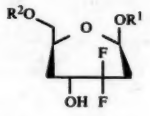
U.S. Cl. 536—4.1 **18 Claims**

1. A process for preparing a 2-deoxy-2,2-difluoroxylose of formula



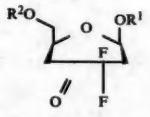
I

wherein R^1 and R^2 are independently hydroxy protecting groups; comprising the oxidation of a ribose of formula



II

in the presence of an inert organic solvent to give an intermediate of formula



III

which is then reduced stereoselectively with a hydride reducing agent in an inert solvent.

4,983,725

MANNOBIOSE DERIVATIVES

Hideki Miyaji, Inazawa; Shusaburo Hokukoku, Kani; Munehiro Tomikawa, Chiba; Sadao Hirota, Chigasaki, and Hiroshi Kikuchi, Tokyo, all of Japan, assignors to Meito Sangyo Co., Ltd., Nagoya and Daiichi Seiyaku Co., Ltd., Tokyo, both of, Japan

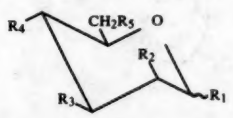
Filed Mar. 31, 1988, Ser. No. 176,329

Claims priority, application Japan, Apr. 3, 1987, 62-82736

Int. Cl.[5] C07H *3/04, 5/04*

U.S. Cl. 536—4.1 **7 Claims**

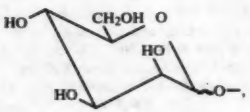
1. A mannobiose derivative represented by

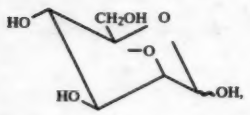


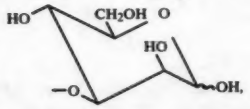
[I]

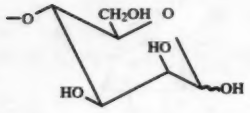
wherein [groups of] R_1 to R_5 each represents —OH, —OR_6, —NHR_6, or a group represented by the following formula (a), (b), (c), (d) or (e), provided that one of R_1 to R_5 represents —OR_6 or —NHR_6, one of the other 4 groups of R_1 to R_5 represents one of the groups represented by the formulae (a) to (e), and the remaining 3 groups of R_1 to R_5 represents —OH

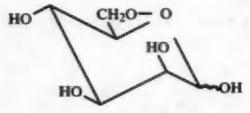
and wherein R_6 represents an aliphatic acyl group having 12 to 30 carbon atoms:


(a)


(b)


(c)


(d)


(e)

wherein ~~~ represents α or β bond.

4,983,726

PROCESS FOR PREPARING NITROSOUREA DERIVATIVES

Pierre Roger, Montigny-les-Bretonneux; Patrick Choay, Paris; Claude Monneret, and Jean-Paul Fournier, both of Paris, all of France, assignors to Sanofi S.A., Paris, France

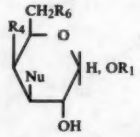
Division of Ser. No. 181,760, Apr. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 732,007, Apr. 24, 1985, Pat. No. 4,902,791. This application Nov. 24, 1989, Ser. No. 440,905

Claims priority, application France, Aug. 30, 1983, 83 13878; Apr. 22, 1987, 87 05708; Apr. 22, 1987, 87 05709

Int. Cl.[5] A61K *31/04;* **C07C** *125/065, 111/00;* **C07H** *5/06*

U.S. Cl. 536—17.7 **29 Claims**

1. Process for the preparation of a nitrosourea derivative of formula I as follows:


I

in which:

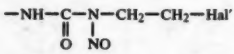
R_1 is alkyl of 1 to 12 carbon atoms or aralkyl of 7 to 12 carbon atoms or aralkyl of 7 to 12 carbon atoms substituted on the aromatic nucleus by one or more halogens or NO_2 or CF_3 groups or alkoxy groups of 1 to 4 carbon atoms,

R_4 is hydrogen or halogen,

R_6 is —OH or

R is alkyl of 1 to 6 carbon atoms, aryl or aryl substituted by one or more halogens or NO_2 or CF_3 groups or alkoxy groups of 1 to 4 carbon atoms,

Nu is

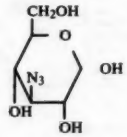


and

Hal' is halogen;

said process comprising the steps of:

(1) glycosylating a compound of formula II as follows:

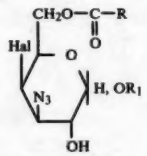

II

with an alcohol, R_1OH, in order to convert the —OH group at position 1 into an $—OR_1$ group;

(2) esterifying the glycosylated product of step 1 with an acid, R—COOH, in order to convert the —OH group at position 6 to a

group;

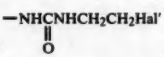
(3) halogenating the esterified product of step 2 in order to introduce a halogen at position 4 and produce a halogenated compound of formula III as follows:


III

in which Hal is halogen;

(4) reducing the halogenated compound of formula III so as to reduce the $—N_3$ group at position 3 to a $—NH_2$ group;

(5) reacting the reduced product of step 4 with a halogenoethylisocyanate in order to convert the $—NH_2$ group at position 3 to a



group; and then

(6) reacting the isocyanate product of step 5 with an alkali metal nitrite in order to convert the

$$-NHCNHCH_2CH_2Hal'$$
$$\|$$
$$O$$

group at position 3 to a

$$-NHCNCH_2CH_2Hal'$$
$$\|\ |$$
$$ONO$$

group.

4,983,727

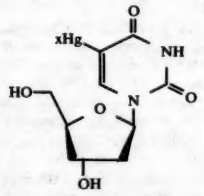
PALLADIUM MEDIATED REACTION OF ORGANIC DISULFIDES WITH MERCURATED NUCLEIC ACID COMPONENTS

Donald E. Bergstrom, and Jeffrey A. Jenson, both of Grand Forks, N. Dak., assignors to University of North Dakota School of Engineering & Mines Foundation, Grand Forks, N. Dak.

Filed Apr. 11, 1988, Ser. No. 179,751
Int. Cl.[5] C07H *19/00*
U.S. Cl. 536—23 **17 Claims**

1. A process of preparing a C-5 substituted nucleoside useful as linking units for probes, therapeutics and nucleotide sequencing, said process comprising:

reacting a C-5 mecuri-substituted nucleic acid moiety of the formula:



wherein X is a soluble organic or inorganic ion, with a disulfide of the formula $(RS)_2$,

wherein R is a C_1 to C_{20} alkyl, aryl, alkylaryl, alkoxyalkyl, alkyl careboxyl, aklylcarboxamido, alkyl carbonyl or a C_1 to C_{20} functionally substituted alkyl group,

said reaction occuring in the presence of a mediating effective amount of palladium(II) ion source to provide a C-5 substituted nucleoside having a C-5 linker arm attached which will not interfere with the normal Watson-Crick hydrogen bonding process.

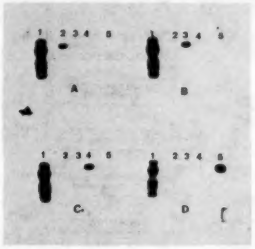
4,983,728

NUCLEIC ACID PROBES OF HUMAN PAPILLOMA VIRUS

Albert Herzog, Eppegem; Alfredo Cravador, Rhode-St-Genese; Sophie Houard, Brussels, and Alex Bollen, Itterbeek, all of Belgium, assignors to Ire-Celltarg S.A., Fleurus, Belgium

Filed Jul. 28, 1988, Ser. No. 225,381
Claims priority, application France, Jul. 31, 1987, 87 10917; Apr. 5, 1988, 88 04436
Int. Cl.[5] C12Q *1/68;* C07H *21/04;* G01N *33/571;* C12P *19/34*
U.S. Cl. 536—27 **17 Claims**

1. Nucleic acid probe useful for detecting indifferently eight types of human papilloma virus, HPV1a, HPV5, HPV6b HPV8, HPV11, HPV16, HPV18 and HPV33, consisting of a sequence of labelled nucleic acids, said probe consisting essentially of a mixture of oligomers, which include a sequence of 12 nucleotides X-A-A-A-A-C-G-A-A-A-G-X with X=T or U, or



its complement extended on each side by 1 to 10 corresponding nucleotides for each of the eight virus types.

4,983,729

DNA FRAGMENT ENCODING A RUBBER POLYMERASE AND ITS USE

Leonard A. Sikora, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 19, 1989, Ser. No. 424,138
Int. Cl.[5] C07H *15/12, 19/06;* C12N *1/20, 15/00*
U.S. Cl. 536—28 **27 Claims**

1. A DNA fragment that comprises a first DNA sequence that encodes rubber polymerase or a fragment thereof.

4,983,730

WATER SOLUBLE CELLULOSE ACETATE COMPOSITION HAVING IMPROVED PROCESSABILITY AND TENSILE PROPERTIES

Kenneth A. Domeshek, Matthews, and Karen L. Zazzara, Gastonia, both of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 2, 1988, Ser. No. 240,875
Int. Cl.[5] C08B *3/06;* A61K *9/30, 9/36*
U.S. Cl. 536—69 **18 Claims**

1. A water soluble cellulose acetate composition having improved processability and tensile properties suitable for application as films, coatings and fibers and comprising one or more lower molecular weight water soluble cellulose acetate components and one or more higher molecular weight water soluble cellulose acetate components, and wherein said lower molecular weight water soluble cellulose acetate components have solution viscosities at least 20 percent lower than that of said higher molecular weight water soluble cellulose acetate components.

4,983,731

SEPARATION AND PURIFICATION OF SUGAR ESTERS

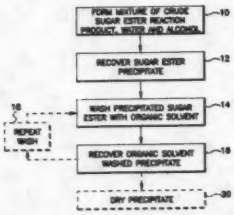
Frederick W. Wagner, Walton; Maria A. Dean, Lincoln; Rebecca S. de la Motte, Lincoln, and Virginia H. Stryker, Lincoln, all of Nebr., assignors to Nebraska Department of Economic Development, Nebr.

Filed Mar. 17, 1989, Ser. No. 325,199
Int. Cl.[5] C07H *1/00, 13/02*
U.S. Cl. 536—127 **16 Claims**

1. A method for purifying a sugar ester product from a crude reaction mixture containing the sugar ester product, which is produced by a solvent-free, transparent emulsion process, which consists essentially of:

dissolving the crude reaction mixture in a lower aliphatic alcohol to produce a solution with undissolved residue;

removing undissolved residue from the solution to produce a clarified solution; and



combining the clarified solution with a volume of water that is approximately 1 to 5 times the volume of the clarified solution to form a precipitate of the purified sugar ester.

4,983,732

METHOD OF DEPROTECTION OF 3-AMINO AZETIDINONES

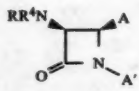
Larry C. Blaszczak; John E. Munroe, both of Indianapolis, and Douglas O. Spry, Mooresville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 80,354, Jul. 31, 1987, abandoned. This application Sep. 21, 1989, Ser. No. 410,208

Int. Cl.[5] C07B *511/00*; C07D *205/095, 205/085, 471/04*

U.S. Cl. 540—360 3 Claims

1. A compound of the formula



wherein R^4 is phenoxyacetyl, phenylacetyl, C_1 to C_6 alkanoyl or chloroacetyl; wherein R is allyloxycarbonyl, t-butoxycarbonyl, naphthyloxycarbonyl, trichloroethyloxycarbonyl, or p-nitrobenzyloxycarbonyl; A is C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl or a group of the formula $—S(C_1–C_4 \text{ alkyl})CO_2R'$, wherein R' is hydrogen or a carboxy-protecting group; and A' is hydrogen or an amide-protecting group.

4,983,733

PROCESS FOR PREPARING 2-AROMATIC-3-HALOBENZOTHIAZEPINES

David R. Borcherding, Roeland Park, Kans., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed Nov. 20, 1989, Ser. No. 438,303

Int. Cl.[5] C07D *281/10*

U.S. Cl. 540—491 8 Claims

1. A process for preparing a 2-aromatic-3HALObenzothiazepine comprising contacting a 2,3-dihydro-2-aromatic-3-hydroxybenzothiazepine with a thionyl HALide under conditions sufficient to prepare the 2-aromatic-3-HALObenzothiazepine.

4,983,734

HIGH-ENERGY INSENSITIVE CYCLIC NITRAMINES

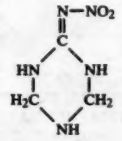
Der-Shing Huang, Carmichael, and Renato R. Rindone, Fair Oaks, both of Calif., assignors to Aerojet General Corporation, Folsom, Calif.

Division of Ser. No. 320,143, Mar. 7, 1989, Pat. No. 4,937,340. This application Dec. 5, 1989, Ser. No. 446,357

Int. Cl.[5] C07D *251/42*

U.S. Cl. 544—194 3 Claims

1. A method for the preparation of an acid salt of a compound having the formula



comprising reacting hexamethylenetetramine with nitroguanidine in an acidic reaction medium, and recovering said acid salt of said compound from the resulting reaction mixture.

4,983,735

PREPARATION OF ALCOHOL-EXTENDED AND AMINE-EXTENDED PIPERAZINES

George E. Hartwell; Robert G. Bowman, and David C. Molzahn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 20, 1988, Ser. No. 221,710

Int. Cl.[5] C07D *295/08, 295/12*

U.S. Cl. 544—402 26 Claims

1. A process for preparing alcohol-extended and amine-extended piperazines comprising contacting a difunctional aliphatic alcohol with a reactant amine, the difunctional alcohol having at least one hydroxyl moiety bound to a primary carbon atom and at least one additional moiety selected from the group consisting of hydroxyl, primary amine and secondary amine functionalities, and wherein at least one of the difunctional alcohol or reactant amine contains a piperazine moiety, the contacting occurring in the presence of a catalyst under reaction conditions such that a mixture of alcohol-extended and/or amine-extended piperazines is formed, said catalyst containing a tungsten heteropoly acid.

23. A process for preparing N-(2-aminoethyl)piperazine comprising contacting monoethanolamine with piperazine in the presence of a catalyst containing titania-supported 12-tungstophosphoric acid under conditions sufficient to prepare N-(2-aminoethyl)piperazine in a selectivity of at least about 30 weight percent.

4,983,736

AMINES CATALYSIS USING METALLIC POLYPHOSPHATE CONDENSATION CATALYSTS HAVING A CONDENSED STRUCTURE

Arthur R. Doumaux, Jr., Charleston, and David J. Schreck, Cross Lanes, both of W. Va., assignors to Union Carbide Chemicals and Plastic Company Inc., Danbury, Conn.

Filed Aug. 8, 1989, Ser. No. 390,709

Int. Cl.[5] C07D *295/12*; C07C *209/00*

U.S. Cl. 544—402 92 Claims

1. A process of making polyalkylene polyamines which comprises condensing an amino compound, said amino compound comprising ammonia, one or more compounds containing nitrogen to which is bonded an active hydrogen or mixtures thereof, in the presence of a metallic polyphosphate condensation catalyst having a condensed structure, said condensation catalyst comprising a metallic pyrophosphate, a metallic polyphosphate, a metallic metaphosphate, a metallic ultraphosphate, a metallic metaphosphimate, a metallic phos-

phoramidate, a metallic amidophosphate, a metallic imidophosphate or mixtures thereof.

4,983,737

ETHYLENICALLY UNSATURATED COMPOUNDS CONTAINING 1-HYDROCARBYLOXY-2,2,6,6-TETRAMETHYLPIPERIDINE MOIETIES, AND POLYMERS, COPOLYMERS AND STABILIZED COMPOSITIONS

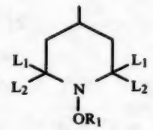
Ramanathan Ravichandran, Nanuet, N.Y.; Peter J. Schirmann, Fairfield, Conn., and Andrew Mar, Norwalk, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 326,705, Mar. 21, 1989. This application Feb. 14, 1990, Ser. No. 479,912

Int. Cl.[5] C07D *211/00*

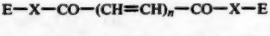
U.S. Cl. 546—184 **20 Claims**

1. An ethylenically unsaturated, polymerizable monomer containing a hindered amine moiety substituted on the 1-N atom with a hydrocarbyloxy group, said moiety having the formula E

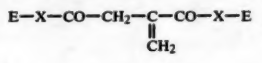


(E)

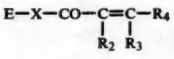
where L_1 and L_2 are independently alkyl of 1 to 4 carbon atoms, or L_1 and L_2 together are pentamethylene, and R_1 is hydrocarbyl, and said monomer is selected from the group consisting of formulas I–IX



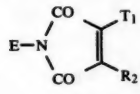
(I)



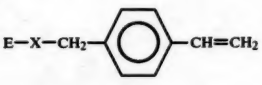
(II)



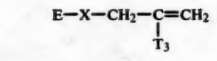
(III)



(IV)

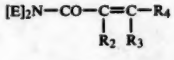


(V)

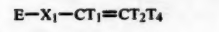


(VI)

(VII)



(VIII)



(IX)

where

R_1 is alkyl of 1 to 36 carbon atoms, alkenyl of 2 to 18 carbon atoms, alkynyl of 2 to 18 carbon atoms, aralkyl of 7 to 15 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, cycloalkenyl of 5 to 12 carbon atoms, a radical of a saturated or unsaturated bicyclic or tricyclic hydrocarbon of 7 to 12 carbon atoms, or aryl of 6 to 10 carbon atoms or said aryl substituted by alkyl,

X is a direct bond, —O(polyoxyalkyleneO)— of 2 to 12 carbon atoms, —O—, —NH— or —NG—, where G is alkyl of 1 to 8 carbon atoms,

X_1 is a direct bond or —O—,

n is 1 or 2,

T_1 T_2 and T_4 are independently hydrogen, halogen, alkyl of 1 to 18 carbon atoms or aryl of 6 to 10 carbon atoms,

T_3 is hydrogen or methyl, and

R_2, R_3 and R_4 are independently hydrogen or alkyl of 1 to 12 carbon atoms, or R_2 is also cyano in formula III.

4,983,738

REACTIVE HINDERED AMINE LIGHT STABILIZERS

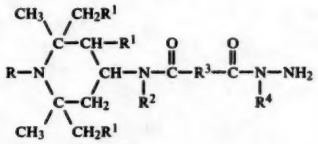
Robert T. Kazmierczak, and Ronald E. Mac Leay, both of Williamsville, N.Y., assignors to Atochem North America, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 84,602, Aug. 12, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,408

Int. Cl.[5] C07D *211/58, 401/12*

U.S. Cl. 546—208 **9 Claims**

1. A compound of the formula



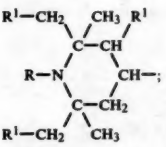
I

where

R is hydrogen, oxy, hydroxy, unsubstituted aliphatic of 1 to 20 carbons, unsubstituted araliphatic of 7 to 12 carbons, unsubstituted aliphatic acyl of 2 to 10 carbons, unsubstituted aryl acyl of 7 to 13 carbons, alkoxycarboxyl of 2 to 9 carbons, unsubstituted aryloxycarbonyl of 7 to 15 carbons, unsubstituted aliphatic, unsubstituted aryl, unsubstituted alicyclic or unsubstituted araliphatic substituted carbamoyl of 2 to 13 carbons, 2-cyanoethyl, unsubstituted hydroxyaliphatic of 1 to 6 carbons, unsubstituted epoxyaliphatic of 3 to 10 carbons or a polyalkylene oxide group of 4 to 30 carbons;

R^1 is hydrogen or lower alkyl of 1 to 4 carbons;

R^2 is hydrogen, unsubstituted aliphatic of 1 to 10 carbons, unsubstituted alicylic of 5 to 12 carbons, unsubstituted araliphatic of 7 to 12 carbons, unsubstituted aryl of 6 to 12 carbons, 2-cyanoethyl or a radical of the formula



R^3 is a direct bond, an alkylene diradical of 1 to 14 carbons, an alkenylene diradical of 2 to 10 carbons, an oxydialkylene or thiodialkylene diradical of 4 to 10 carbons or a substituted or unsubstituted o-, m- or p-phenylene diradical where the substiuents may be lower alkyl, lower alkoxy, hydroxy, bromo, chloro, mercapto or lower alkylmercapto;

R^2 and R^3 may be linked together to form a 5-membered lactam ring; and

R^4 is hydrogen, a primary or secondary unsubstituted aliphatic of 1 to 8 carbons, unsubstituted araliphatic of 7 to 12 carbons or unsubstituted alicyclic of 5 to 12 carbons.

9. The compound of claim 1 where R, R^1 and R^4 are hydro-

gen, R^3 is a 1,2-ethylene diradical and R^2 is a methylene group linked to R^3 to form a 5-membered lactam ring.

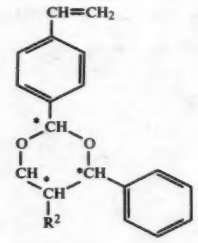
4,983,739

OPTICALLY ACTIVE STYRENE COMPOUNDS

Jürgen Kaschig, Freiburg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

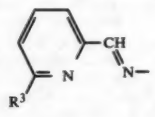
Division of Ser. No. 258,369, Oct. 17, 1988, Pat. No. 4,904,790, which is a division of Ser. No. 47,099, May 9, 1987, Pat. No. 4,800,224. This application Dec. 21, 1989, Ser. No. 454,321
Claims priority, application Switzerland, May 16, 1986, 1985/86
Int. Cl.[5] C07D *401/12*
U.S. Cl. 546—268 2 Claims

1. An optically active compound of the formula

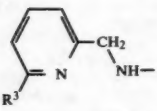


in which R^2 is a radical of the formula II or IIa

(II)



(IIa)



in which R^3 is H or $-CH_3$,
and * represents predominantly R or predominantly S configuration.

4,983,740

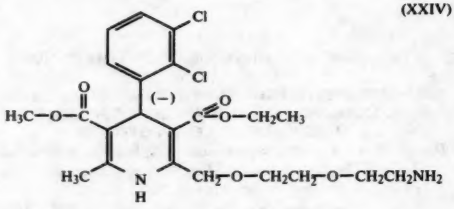
PROCESS FOR 1,4-DIHYDROPYRIDINE COMPOUNDS

Jean L. Peglion, Le Vesinet; Yves M. Gargouil, Paris, and Jean P. Vilaine, Chatenay Malabry, all of France, assignors to Adir et Compagnie, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 81,303, Aug. 3, 1987, Pat. No. 4,870,091. This application Jul. 27, 1989, Ser. No. 386,430
Claims priority, application France, Aug. 4, 1986, 86 11260; Jul. 4, 1989, 89 08920
Int. Cl.[5] C07D *211/86*
U.S. Cl. 546—321 1 Claim

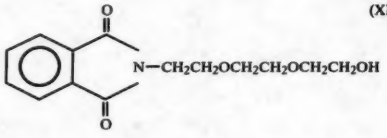
1. A process for preparing (−)-2-{[2-(2-Amino-ethoxy)ethoxy]methyl}-4-(2,3-dichlorophenyl)-3-ethoxycarbonyl-5-methoxycarbonyl-6-methyl-1,4-dihydropyridine, the compound of formula XXIV:

(XXIV)



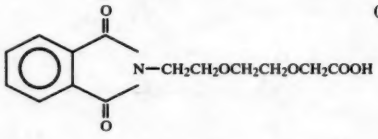
wherein 2-[2-(2-chloroethoxy)ethoxy]ethanol is condensed with potassium phthalimide, in dimethylformamide in the heated state, to form 2-[2-(2-phthalimido-ethoxy)ethoxy]ethanol, the compound of formula XIV:

(XIV)



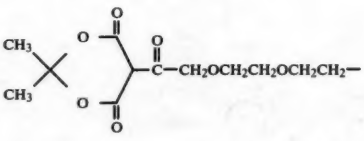
which is converted by means of Jones reagent to 2-[2-(2-phthalimidoethoxy)ethoxy] acetic acid, the compound of formula XV

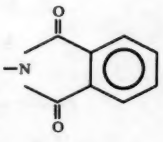
(XV)



which is treated with carbonyldiimidazole and Meldrum's acid in the presence of pyridine in methylene chloride to obtain the compound of formula XVI:

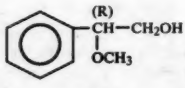
(XVI)





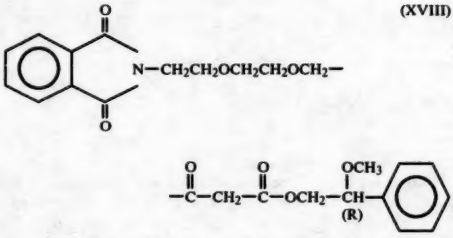
which is then reacted with (R)-2-phenyl-2-methoxyethanol, the compound of formula XVII

(XVII)



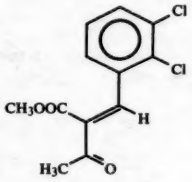
to obtain the β-keto ester of formula XVIII

(XVIII)



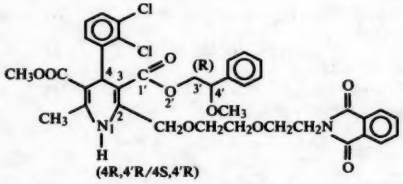
which is condensed in the presence of ammonium formate in ethanol with a benzylidene compound of formula XIX

(XIX)



to obtain (4R,4'R/4S,4'R)-4-(2,3-dichlorophenyl)-5-methoxycarbonyl-3-(2-methoxy-2-phenylethoxycarbonyl)-6-methyl-2-{[2-(2-phthalimidoethoxy)ethoxy]methyl}-1,4-dihydropyridine, the compound of formula XX

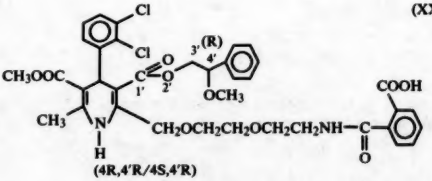
(XX)



(4R,4'R/4S,4'R)

and then: either: this compound is subjected to the action of aqueous sodium bicarbonate solution to obtain (4R,4'R/4S,4'R)-2-[{2-[2-(2-carboxyphenylcarboxamido)ethoxy]ethoxy}methyl]-4-(2,3-dichlorophenyl)-5-methoxycarbonyl-3-(2-methoxy-2-phenylethoxycarbonyl)-6-methyl-1,4-dihydropyridine, the compound of formula XXI:

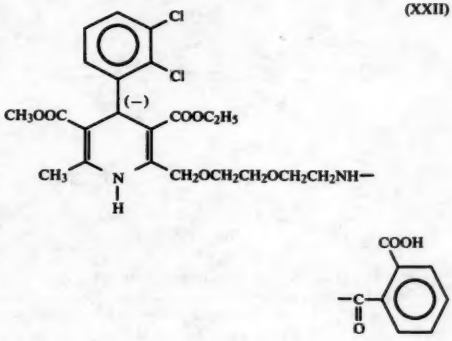
(XXI)



(4R,4'R/4S,4'R)

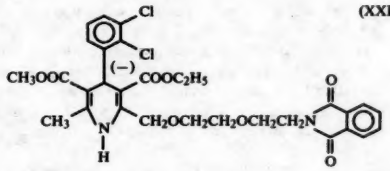
which is treated after separation by HPLC in the heated state with a mixture of glyme and sodium ethylate to obtain a mixture containing (−)-2-[{2-[2-(2-carboxyphenylcarboxamido)ethoxy]ethoxy}-methyl]-4-(2,3-dichlorophenyl)-3-ethoxycarbonyl-5-methoxycarbonyl-6-methyl-1,4-dihydropyridine, the compound of formula XXII:

(XXII)



and its homolog substituted at the 5-position with an ethoxycarbonyl radical, or: the compound of formula XX is separated by chromatography on a silica column, using a mixture of methylene chloride and ethyl acetate (95:5 V/V) as eluant, to obtain the less polar isomer of 4-(2,3-dichlorophenyl)-5-methoxycarbonyl-3-(2-methoxy-2-phenylethoxycarbonyl)-6-methyl-2-{[2-(2-phthalimidoethoxy)ethoxy]methyl}-1,4-dihydropyridine, which is then subjected to the action of sodium ethanolate in the presence of glyme in solution in ethanol to obtain a mixture containing the compound of formula XXII and its homolog substituted at the 5-position with an ethoxycarbonyl radical, which is then subjected to the action of carbonyldiimidazole in solution in a halogenated alkane at room temperature to obtain a mixture containing (−)-4-(2,3-dichlorophenyl)-3-ethoxycarbonyl-5-methoxycarbonyl-6-methyl-2-{[2-(2-phthalimidoethoxy)ethoxy]methyl}-1,4-dihydropyridine, the compound of formula XXIII:

(XXIII)



and its homolog substituted at the 5-position with an ethoxycarbonyl radical, which mixture is then separated by (reverse phase) HPLC to obtain (−)-4-(2,3-dichlorophenyl)-3-ethoxycarbonyl-5-methoxycarbonyl-6-methyl-2-{[2-(2-phthalimidoethoxy)ethoxy]methyl}-1,4-dihydropyridine, which is then brought to reflux in ethanol in the presence of hydrazine hydrate to give the compound of formula XXIV, which can then be salified with a pharmaceutically-compatible organic or inorganic acid.

4,983,741

1,2,4,5-BENZOYLENEBIS(NAPHTHO[2,3-D]IMIDAZOLE) COMPOUNDS AND PHOTOSENSITIVE MEMBERS CONTAINING THEM

Satoshi Katayama, Tenri; Eiji Imada, and Shuhei Tsuchimoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

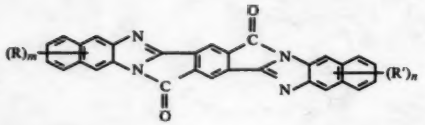
Filed Dec. 8, 1988, Ser. No. 281,046

Claims priority, application Japan, Dec. 8, 1987, 62-310467

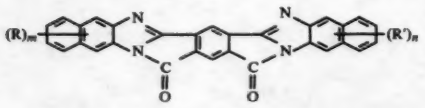
Int. Cl.[5] G03G 5/06; C07D 487/22

U.S. Cl. 548—324 **14 Claims**

1. 1,2,4,5-Benzoylenebis (naphtho[2,3-d]imidazole) compounds of the following formula (I) or (II):



(I)



(II)

wherein R and R' each are a hydrogen atom, a halogen atom, a hydroxyl group, a carboxyl group which may be esterified, a sulfonic acid group which may be esterified, a lower alkyl group, a lower alkenyl group, a lower alkoxy group, an aryl group which may be substituted, an aralkyl group which may be substituted, a carbamoyl group which may be substituted or a sulfamoyl group which may be substituted and m and n each are an integer of 1 or 2.

4,983,742

FIRE-RETARDANT 1-BUTENE RESIN COMPOSITION

Motoyasu Yusawa, Iwakuni, and Chikara Igarashi, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 704,039, Feb. 21, 1985, abandoned, which is a continuation of Ser. No. 610,861, May 16, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 946,165

Claims priority, application Japan, May 17, 1983, 58-84951

Int. Cl.[5] C08K *3/10*

U.S. Cl. 524—436 16 Claims

1. A fire-retardant 1-butene resin composition composed of

(A) 100 parts by weight of a 1-butene polymer or copolymer containing 0 to 20 mole% of an olefin with 2 to 20 carbon atoms other than 1-butene as a comonomer,

(B) 110 to 1,000 parts by weight of an inorganic hydroxide in the form of a fine powder and selected from the group consisting of magnesium hydroxide and aluminum hydroxide, and

(C) 10 to 150 parts by weight of a graft-modified olefin resin resulting from grafting of an unsaturated carboxylic acid selected from the group consisting of maleic acid, citraconic acid, itaconic acid, 5-norbornene-2,3-dicarboxylic acid and an acid anhydride thereof, to a polymer or a copolymer selected from the group consisting of a polypropylene, a propylene/ethylene copolymer containing up to 20 mole% of ethylene, a propylene/1-butene copolymer containing up to 30 mole% of 1-butene and a propylene/4-methyl-1-pentene copolymer containing up to 30 mole% of 4-methyl-1-pentene.

4,983,743

5-ALKYL TETRAMIC ACIDS

Thomas Meul, Visp, Switzerland, assignor to Lonza, Ltd., Gampel/Valais, Switzerland

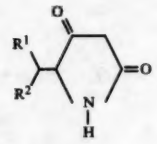
Filed Sep. 5, 1989, Ser. No. 402,356

Claims priority, application Switzerland, Sep. 6, 1988, 3337/88

Int. Cl.[5] C07D *207/36*

U.S. Cl. 548—544 12 Claims

1. Substituted tetramic acid of the formula:



(I)

or a tautomer thereof, wherein

(a) R^1 is a straight-chain or branched alkyl group having 2 to 6 atoms or a cycloalkyl group having 4 to 7 C atoms or a group of the form $—[CH_2]_n—Q$ with n being 1 or 2, and Q being one of the above-mentioned cycloalkyl groups or a phenyl group, and R^2, independently therefrom, is hydrogen or a straight-chain alkyl group having 1 to 4 C atoms, or

(b) R^1 or R^2 together are an optionally branched alkanediyl group, which, in connection with the linking C atom, forms a 4- to 7-member ring optionally substituted with one or more lower alkyl groups, except 5-benzyl tetramic acid, 5-(2-butyl) tetramic acid, 5-isobutyl tetramic acid and 5-n-hexyl tetramic acid.

4,983,744

SUBSTITUTED THIENYLETHYLAMINES AND PROCESS FOR THEIR PRODUCTION

Aleksander Warm, and John McGarrity, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

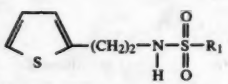
Division of Ser. No. 07/418,340, Oct. 6, 1989. This application Jan. 24, 1990, Ser. No. 469,354

Claims priority, application Switzerland, Oct. 11, 1988, 3795/88

Int. Cl.[5] C07D *333/12, 333/22*

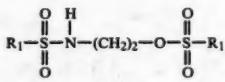
U.S. Cl. 549—75 6 Claims

1. Process for the production of a substituted thienylethylamine of the formula:



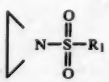
(IV)

wherein R is formyl, acetyl or benzoyl or is benzyl, which is ring-substituted by at least one halogen atom, and R_1 is lower alkyl, phenyl or substituted phenyl, comprising: converting a substituted ethanolamine of the formula:



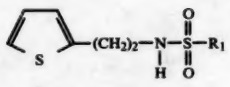
(I)

wherein R_1 has the above-mentioned meaning, with a strong base to an aziridine of the formula:



(II)

wherein R_1 has the above-mentioned meaning, converting the aziridine of formula (II) with 2-thienyllithium to a thienylethylamine of the formula:



(III)

wherein R_1 has the above-mentioned meaning, and converting the thienylethylamine of formula (III) with a compound RX, wherein R has the above-mentioned meaning and X is chlorine, bromine or iodine, to the thienylethylamine of formula (IV).

4,983,745

MESO-LACTIDE, PROCESSES FOR PREPARING IT AND POLYMERS AND COPOLYMERS PRODUCED THEREFROM

Manfred Muller, Bickenbach; Joachim Hess, Bingen; Wilhem-Gustav Schnell, Ingelheim am Rhein; Dieter Bendix, Ingelheim am Rhein, and Gunther Entenmann, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Apr. 3, 1989, Ser. No. 335,089

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720060

Int. Cl.[5] C07D *319/12*

U.S. Cl. 549—274 **1 Claim**

1. Process for preparing meso-lactide, characterised in that racemic polylactic acid is depolymerised in the presence of tin, tin salts or organic tin compounds as catalyst, the lactide formed is recrystallised in order to separate off a quantity of D,L-lactide, the mother liquor remaining is concentrated by evaporation and the residue is rectified, the first distillate obtained being the meso-lactide, which optionally is recrystallised.

4,983,746

OXETANONES AND PROCESS FOR THEIR PRODUCTION

Pierre Barbier, Rixheim, France; Fernand Schneider, Basel, and Ulrich Widmer, Rheinfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

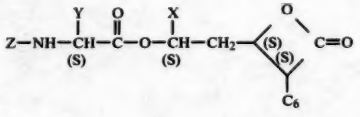
Continuation of Ser. No. 195,335, May 18, 1988, abandoned, which is a continuation of Ser. No. 801,345, Nov. 25, 1985, abandoned. This application Aug. 8, 1989, Ser. No. 391,732

Claims priority, application Switzerland, Dec. 21, 1984, 6101/84; Sep. 19, 1985, 4067/85

Int. Cl.[5] C07D *305/12*

U.S. Cl. 549—328 **5 Claims**

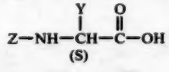
1. A process for the preparation of compounds of the formula



I

wherein X is undecyl or 2Z,5Z-undecadienyl; C_6 is n-hexyl; Y is isobutyl and Z is formyl

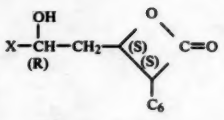
which process comprises esterifying an acid of the formula



II

wherein Z and Y are as defined in Formula I;

with an alcohol of the formula



III

wherein X, C_6, Y and Z are as defined in Formula I.

4,983,747

PROCESS FOR PREPARATION OF PERFLUORO ORGANIC COMPOUNDS

Masakatsu Nishimura, Tokuyama; Naoya Okada, Nanyo; Yasuo Murata, Kudamatsu, and Yasuhiko Hirai, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Division of Ser. No. 127,115, Dec. 1, 1987, Pat. No. 4,929,317. This application Mar. 15, 1990, Ser. No. 493,803

Claims priority, application Japan, Dec. 1, 1986, 61-284260; Dec. 1, 1986, 61-284261

Int. Cl.[5] C07C *309/08*

U.S. Cl. 549—423 **1 Claim**

1. A process for the preparation of a perfluoro organic compound by perfluorination of an organic compound having carbon-to-hydrogen bonds, which consists essentially of:

(i) a first step of fluorinating an organic compound having carbon-to-hydrogen bonds by contact with at least one metal fluoride selected from the group consisting of cobalt trifluoride, potassium tetrafluorocobaltate, silver difluoride and manganese trifluoride to form a mixture of a perfluoro organic compound with partially fluorinated, organic compounds in which the ratio of the number of fluorine atoms to the number of hydrogen atoms is at least 8; and

(ii) a second step of contacting substantially all of said mixture formed in said first step with molecular fluorine at a temperature of 110° to 180° C. to convert said partially fluorinated organic compounds to a perfluoro organic compound as product and recovering said perfluoro organic compound.

4,983,748

ACETALS USEFUL FOR THE PREPARATION OF POLYSACCHARIDE DERIVATIVES

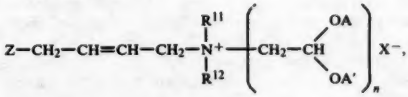
John J. Tsai, Belle Mead; Patrick G. Jobe, Westfield, both of N.J.; Diane J. Lamb, Lincoln, Nebr.; Robert L. Billmrs, Stockton, and Martin M. Tessler, Edison, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 37,282, Apr. 10, 1987, Pat. No. 4,804,769, which is a division of Ser. No. 829,675, Feb. 14, 1986, Pat. No. 4,703,116, which is a continuation-in-part of Ser. No. 758,634, Jul. 24, 1985, Pat. No. 4,675,394, which is a continuation-in-part of Ser. No. 641,820, Aug. 17, 1984, abandoned. This application Dec. 28, 1988, Ser. No. 290,934

Int. Cl.[5] C07D *303/08, 303/12*

U.S. Cl. 549—551 **17 Claims**

1. An acetal selected from the group consisting of acetals having the structure



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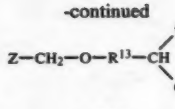
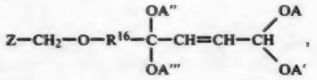
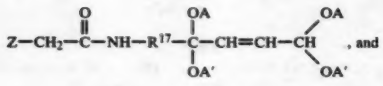
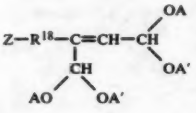






, and



wherein R^{11} and R^{12} are independently an alkyl, aryl, aralkyl, or alkaryl group when n is 1, R^{11} or R^{12} is one of the groups when n is 2, or R^{11} and R^{12} are not present when n is 3; wherein R^{13} is an alkyl group, which can contain an ether linkage, or an aralkyl group; R^{16}, R^{17}, and R^{18} are individually an alkyl group; A and A' are independently a lower alkyl group; A'' and A''' are independently a lower alkyl group; X is a halogen anion; and Z is a halogen or an epoxide group.

4,983,749

PROCESS FOR PREPARING A S-SUBSTITUTED PHOSPHORO-CHLORIDOTHIOLATE

Tasuhiro Tsujii; Tatsuo Isogai; Takao Awazu, and Tokiya Kimura, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 916,106, Oct. 7, 1986, Pat. No. 4,736,050. This application Jan. 15, 1988, Ser. No. 144,230

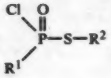
Claims priority, application Japan, Oct. 17, 1985, 60-232168

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[5] C07F 9/02

U.S. Cl. 558—88 **10 Claims**

1. A process for the preparation of a S-substituted phosphorochloridothiolate having the formula:



wherein R^1 is selected from the group consisting of chloro, phenoxy, C_1–C_6 alkoxy, and C_1–C_6 alkoxy which is substituted by phenyl, phenoxy or phenylthio and wherein said phenyl, phenoxy and phenylthio substituents are unsubstituted or are each substituted by halogen, nitro, cyano, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkoxy-C_1–C_6 alkyl, trifluoromethyl, halo-C_1–C_6-alkoxy, C_1–C_6-alkylsulfinyl, C_1–C_6-alkylsulfonyl, phenyl, phenoxy or phehylthio; and R^2 is selected from the group consisting of phenyl, C_1–C_6-alkyl, C_2–C_6 alkenyl, C_2–C_6-alkynyl, and C_3–C_7-cycloalkyl; and wherein each of said alkyl, alkenyl, alkynyl and cycloalkyl groups are unsubstituted or substituted by phenyl, phenoxy or phenylthio; and wherein each of said phenyl, phenoxy or phenylthio substituents are unsubstituted or are substituted by halogen, nitro, cyano, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6-alkoxy-C_1–C_6-alkyl, trifluoromethyl, halo-C_1–C_6-alkoxy, C_1–C_6alkylsulfinyl, C_1–C_6alkylsulfonyl, phenyl, phenoxy and phenylthio; which process comprises:

subjecting an O-substituted phosphorochloridothionate having the formula:

wherein R^1 and R^2 are as defined above, to a Lewis acid catalyst, thereby isomerizing said O-substituted phosphorochloridothionate to said S-substituted phosphorochloridothiolate; wherein said Lewis acid catalyst is (A) a Bronsted acid selected from the group consisting of sulfuric acid, chlorosulfonic acid, fluorosulfonic acid, hydrochloric acid, hydrogen bromide, hydrogen fluoride, hydrogen iodide, hydrogen sulfide, nitric acid, boric acid, pyrosulfuric acid and phosphoric acid, or (B) a metal halide selected from the group consisting of boron trifluoride, aluminum fluoride, aluminum chloride, aluminum bromide, tin tetrachloride, zinc chloride, titanium tetrachloride, ferric chloride, antimony trichloride and antimony pentachloride.

4,983,750

PHOSPHOBETAINES, METHODS FOR THEIR SYNTHESIS AND THEIR USE ESPECIALLY FOR INDUSTRIAL PURPOSES

Joachim Giersberg, Recklinghausen, and Hans-Joachim Kollmeier, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

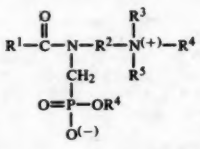
Filed Jun. 26, 1989, Ser. No. 371,497

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826805

Int. Cl.[5] C07F 9/02, 9/10

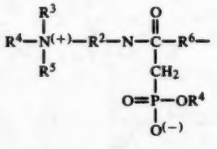
U.S. Cl. 558—134 **3 Claims**

1. A phosphobetaine of the general formula



wherein

R^1 is an alkyl group derived from a natural fatty acid or a mixture of natural fatty acids with, on the average, 10 to 20 carbon atoms, or the group



in which

R^6 is a divalent alkylene group with 1 to 10 carbon atoms,

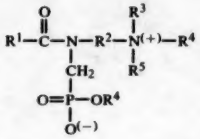
R^2 is $—(CH_2)_3—$,

R^3 is methyl,

R^5 is methyl or benzyl, and

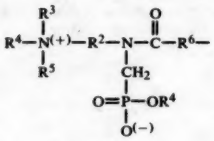
R^4 is alkyl with 1 to 4 carbon atoms.

2. A method for the synthesis of a phosphobetaine of the general formula



wherein

R^1 is an alkyl group derived from a natural fatty acid or a mixture of natural fatty acids with, on the average, 10 to 20 carbon atoms, or the group



in which

R^6 is a divalent alkylene group with 1 to 10 carbon atoms,

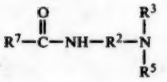
R^2 is $-(CH_2)_3-$,

R^3 is methyl,

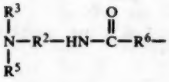
R^5 is methyl or benzyl, and

R^4 is alkyl with 1 to 4 carbon atoms, which comprises

(a) dissolving or dispersing in a polar solvent a compound of the general formula



in which R^2, R^3 and R^5 have the above meaning and R^7 is an alkyl group, an alkyl group substituted with hydroxyl or the group



in which R^2, R^3, R^5 and R^6 have the above meaning and, based on the available tertiary amine groups, at least equimolar amounts of a compound of the general formula

in which R^4 has the above meaning,

(b) slowly adding to the solution or dispersion thus obtained a 1.5- or 2-fold molar amount of formaldehyde, based on the available amino groups,

(c) permitting the reaction mixture thus obtained to react at a temperature of about between 60° to 140° C.,

(d) removing water formed during the reaction, and

(e) at the end of the reaction, removing excess amounts of phosphite ester and formaldehyde, as well as any solvent,

4,983,751

OXAZOLIDINEDIONE DERIVATIVES, METHOD OF PRODUCING THE DERIVATIVES, AND HERBICIDES CONTAINING THE DERIVATIVES

Kenji Hirai; Takamasa Futikami; Atsuko Murata, all of Kanagawa; Hiroaki Hirose; Masahiro Yokota, both of Chiba, and Shoin Nagato, Tokyo, all of Japan, assignors to Sagami Chemical Research Center; Chisso Corporation and Kaken Pharmaceutical Co. Ltd., Japan, a part interest

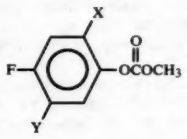
Division of Ser. No. 72,268, Jun. 11, 1987, Pat. No. 4,818,272. This application Jan. 31, 1989, Ser. No. 345,369

Claims priority, application Japan, Oct. 11, 1985, 60-226270; Oct. 11, 1985, 60-226294

Int. Cl.[5] C07C *69/96*

U.S. Cl. 558—272 **1 Claim**

1. A compound of the formula



wherein X is a chlorine atom or a bromine atom and Y is an amino group or an isocyanato group.

4,983,752

PREPARATION OF ACRYLONITRILE

Hans-Dieter Eichhorn, Cleveland; Martin J. Dancey, Middlesbrough, both of Great Britain; Guenter Herrmann, Heidelberg, Fed. Rep. of Germany, and James W. Steen, Middlesbrough, Great Britain, assignors to BASF Chemicals Limited, Cleveland, Great Britain

Filed May 18, 1990, Ser. No. 525,309

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726328

Int. Cl.[5] C07C *253/26*

U.S. Cl. 558—322 **6 Claims**

1. In a process for producing acrylonitrile by the ammoxidation of propylene with ammonia and molecular oxygen or a gas containing molecular oxygen at a temperature of from 300° to 600° C. in the presence of a metal oxide catalyst containing tellurium and one or more of the metals iron, molybdenum and antimony in a fluidized bed, wherein the catalyst is regenerated during the reaction, the improvement which comprises adding to the reaction mixture a solution of oxidic tellurium compounds to regenerate the catalyst.

4,983,753

PRECURSORS AND SYNTHESIS OF D1-(METHYL)-16,16-(DIMETHYL)-11-ALPHA,15-ALPHA BETA-DIHYDROXY-9-OXO-2,13-TRANS,TRANS-PROSTADIENOATES

Middleton B. Floyd, Jr., 5 Babbling Brook La., Suffern, N.Y. 10901

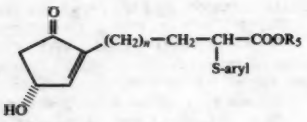
Continuation of Ser. No. 930,711, Nov. 13, 1986, abandoned, which is a division of Ser. No. 633,240, Jul. 23, 1984, Pat. No. 4,644,079, which is a division of Ser. No. 424,692, Sep. 27, 1982, Pat. No. 4,474,979, which is a division of Ser. No. 266,004, May 21, 1981, Pat. No. 4,360,688. This application Jun. 23, 1989, Ser. No. 371,686

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.[5] C07C *177/00*

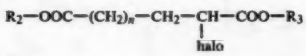
U.S. Cl. 560—17 **4 Claims**

1. A process of preparing cyclopentenone intermediates of the formula



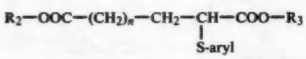
wherein n is an integer in the range of 3–5 inclusive, and R_5 is hydrogen, which comprises:

(i) reacting a 2-halo-alkanedioate diester of the formula



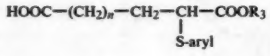
wherein n is as previously defined, R_2 and R_3 are selected from C_1–C_6 alkyl, and R_2 may be the same as or different from R_3, and halo is selected from chloro-, bromo-, and iodo-,

with an alkali metal thio-monocyclic-aryloxide, said alkali metal being selected from the class consisting of lithium, sodium and potassium, and said aryl portion of thio-monocyclic-aryloxide is phenyl or phenyl substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or trifluoromethyl, to form a compound having the formula

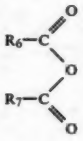


wherein aryl is as previously defined;

(ii) hydrolyzing the preceding compound with strong alkali to form a compound having the formula

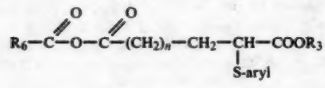


(iii) reacting the preceding compound with a lower anhydride of formula



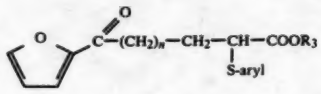
or an acyl halide of the formula

to form a mixed anhydride having the formula

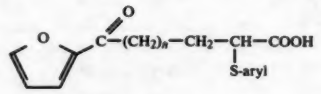


wherein R_6 and R_7 are C_1–C_3 alkyl or halo-substituted C_1–C_3 alkyl, and R_6 may be the same as or different from R_7, and X is chloro, bromo or iodo;

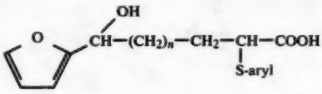
(iv) reacting said mixed anhydride with furan to form an acyl furan compound having the formula



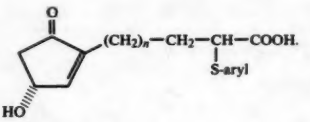
(v) hydrolyzing the ester to form an acyl furan having the formula



(vi) reacting the carbonyl group with a carbonyl reducing agent to form a compound having the formula



and (vii) subjecting the preceding compound to an acid catalyzed rearrangement to form a cyclopentenone having the formula



4,983,754

METHOD FOR THE MANUFACTURE OF DIMETHYL, OCTYL - OR PENTYL - PARA-AMINOBENZOIC ACID

Amihai Eisenstadt, Ramat Hasharon, Israel, assignor to Bromine Compounds Ltd., Beer-Sheva, Israel

Filed Dec. 5, 1988, Ser. No. 280,134

Claims priority, application Israel, Dec. 7, 1987, 84736

Int. Cl.[5] C07C *101/00*

U.S. Cl. 560—19 **9 Claims**

1. A method for the manufacture of an ester selected from the group consisting of dimethyl octyl-p-aminobenzoic acid and dimethyl pentyl p-aminobenzoic acid which comprises the carbonylation of p-bromo-dimethyl aniline in the absence of any promoter in a reaction system having a pH of above 8 in the presence of an alcohol selected from octanol, pentanol or isomers thereof, using a palladium catalyst on an inert support.

4,983,755

SUBSTITUTED HYDRAZONES, PROCESS FOR THE PREPARATION AND THEIR USE AS PESTICIDE

Ulrich Bühmann; Dieter Hübl, and Ernst-Albrecht Pieroh, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

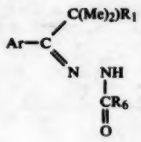
Filed Jul. 17, 1987, Ser. No. 74,973

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624349

Int. Cl.[5] C07C *271/12, 269/06*

U.S. Cl. 560—24 **4 Claims**

1. Substituted hydrazone of the formula II



(II)

wherein

Ar is phenyl, substituted in the para position by one or more members of the group consisting of halogen, fluorinated methoxy, fluorinated ethoxy and trifluoromethyl:

R_1 is methyl or ethyl; and

R_6 is methoxy or ethoxy.

4,983,756

NOVEL CHOLINE DERIVATIVE AND METHOD FOR DETEMINING SERUM CHOLINESTERASE ACTIVITY USING THE SAME

Katsumasa Kuroiwa; Katsuhiro Katayama, both of Koriyama, and Takeshi Nagasawa, Urawa, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushimashi, Japan

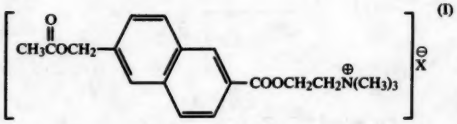
Filed Feb. 15, 1989, Ser. No. 311,329

Claims priority, application Japan, Feb. 24, 1988, 63-41375

Int. Cl.[5] C07C *9/76*; C12Q *1/46*

U.S. Cl. 560—56 **4 Claims**

1. A novel choline derivative represented by the general formula (I),



(I)

wherein X is a halogen atom.

4,983,757

PROCESS FOR PRODUCTION OF CARBOXYLIC ACID ESTERS AND FORMAMIDE

Jiro Ishikawa; Hirofumi Higuchi; Shuji Ebata, and Koichi Kida, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 28, 1990, Ser. No. 500,520

Claims priority, application Japan, Apr. 11, 1989, 1-89737

Int. Cl.[5] C07C *69/76, 233/00*

U.S. Cl. 560—103 **14 Claims**

1. A process for production of carboxylic acid ester and formamide which comprises reacting carboxylic acid amide and formic acid ester in the presence of an alkaline earth metal oxide catalyst.

4,983,758

PROCESS FOR PRODUCING AN OPTICALLY ACTIVE ALPHA-ISOPROPYL-P-CHLOROPHENYLACETIC ACID

Yoshiaki Oda, Kashiwara; Takaharu Ikeda, Konan, and Hiroshi Yamachika, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

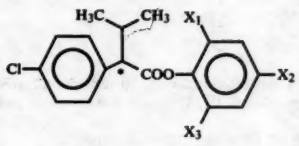
Filed Dec. 2, 1988, Ser. No. 279,095

Claims priority, application Japan, Dec. 3, 1987, 62-306918; Dec. 8, 1987, 62-311632; Dec. 11, 1987, 62-314797; Jan. 22, 1988, 63-13429; Jul. 26, 1988, 63-187461

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—105 **37 Claims**

1. An optically active α-isopropyl-p-chlorophenylacetate of the formula:



(II)

wherein X_1, X_2 and X_3 are independently halogen atoms, or two of them are independently halogen atoms and the third is a hydrogen atom or a lower alkyl group, and the symbol * stands for an asymmetric carbon atom.

4,983,759

PROCESS FOR THE PRODUCTION OF 3,5,6-TRIHYDROXYHEXANOIC ACID DERIVATIVE

Kenji Inoue; Satomi Takahashi; Keiichi Yonetsu, and Noboru Ueyama, all of Hyogo, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

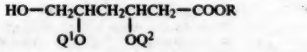
Filed Dec. 20, 1989, Ser. No. 452,470

Claims priority, application Japan, Dec. 21, 1988, 63-323935

Int. Cl.[5] C07C *69/66*; C07D *317/18*

U.S. Cl. 500—174 **8 Claims**

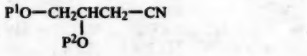
8. A process for the production of 3,5,6-trihydroxyhexanoic acid derivatives of the formula:



(V)

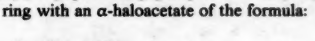
wherein Q^1 and Q^2 are hydroxyl-protecting groups which may together form a ring, and R is an alkyl group, wich comprises steps of:

reacting a butyronitrile derivative of the formula:



(II)

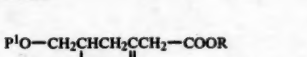
wherein p^1 and p^2 are independently hydrogen atoms or hydroxyl-protecting groups which may together form a ring with an α-haloacetate of the formula:



(III)

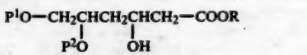
wherein X is a halogen atom, and R is the same as defined above,

in the presence of a metallic catalyst selected from the group consisting of zinc and zinc-copper to form an intermediate product which is then hydrolyzed to a keto acid derivative of the formula:



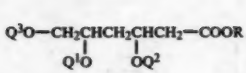
(IV)

wherein p^1, p^2 and R are the same as defined above, reducing the obtained keto acid derivative to form a 3,5,6-trihydroxyhexanoic acid derivative of the formula:



(I)

wherein p^1, p^2 and R are the same as defined above, protecting all of the hydroxy groups in the intermediate (I) to form a derivative of the formula:



(VI)

wherein Q^3 is a hydroxyl-protecting group which can be selectively deprotected, and Q^1, Q^2 and R are the same as defined above, and

then selectively deprotecting the group Q^3.

4,983,760

LOW MOLECULAR WEIGHT POLYMERS OF ACRYLIC ESTERS

Georg Bobar, Bad Durkheim; Klaus Schnell, Ludwigshafen; Gerd Schroeder, Limburgerhof, and Eckehardt Wistuba, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 8, 1990, Ser. No. 461,744

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1989, 3902440

Int. Cl.[5] C07C *69/34*

U.S. Cl. 560—190 1 Claim

1. A low molecular weight polymer of one or more acrylic esters, obtainable by subjecting

(a) from 80 to 100% by weight of at least one acrylic ester of C_1–C_8–alkanol (monomer I) and

(b) 0 to 20% by weight of one or more other copolymerizable monomers (monomer II)

to a free radical polymerization in a solution in isopropanol in a pressure vessel at 130°–140° C. by introducing first from 70 to 95% by weight of a solvent and adding the remainder of the polymerization batch continuously over 3–7 hours in separate portions of which one contains the monomers and, after the polymerization has ended, distilling off the solvent under reduced pressure, the weight proportion of solvent being 5–15% by weight based on the monomers, the weight proportion of initiator being 0.5–3% by weight based on the monomers, and the half-life of the initiator at the polymerization temperature being from 10 seconds to 3 hours.

4,983,761

PROCESS FOR THE PREPARATION OF HIGH-BOILING ACRYLATES AND METHACRYLATES

Siegfried Breuer, Frankfurt am Main; Heinz Delle, Bad Homburg, and Udo Ruldolph, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

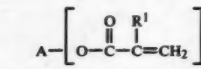
Filed Oct. 5, 1989, Ser. No. 417,558

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1988, 3836093

Int. Cl.[5] C07C *67/02*

U.S. Cl. 560—217 2 Claims

1. In a method of preparing a member of the group consisting or high-boiling acrylates and methacrylates, whose boiling point under normal pressure exceeds 160° C. with an Alpha number from 0 to 5 corresponding to formula I



(I)

where in

R′ represents hydrogen or methyl,

when p is 3, A represents a straight-chain or branched group containing 4 to 6 carbon atoms and which may contain 1 or 2 oxygen bridges, or

when p is 2, A represents a straight-chain or branched group containing 2 to 8 carbon atoms and 0 or 2 to 3 oxygen bridges, by means of the transesterification of a member of the group consisting of methyl acrylate and methyl methacrylate with a polyvalent alcohol;

the improvement in which the reaction mixture of the transesterification is separated from a catalyst and thereafter is subjected to a flash distillation at a bottom temperature of 110° to 170° C. and a pressure of 0.01 to 10 mbar.

4,983,762

PREPARATION OF BIURETO POLYISOCYANATES

Jean Robin, Lyon, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Continuation of Ser. No. 262,188, Oct. 20, 1988, abandoned, which is a continuation of Ser. No. 946,197, Dec. 24, 1986, abandoned. This application Apr. 23, 1990, Ser. No. 512,604

Claims priority, application France, Jul. 4, 1986, 86 09947

Int. Cl.[5] C07C *273/00*

U.S. Cl. 560—335 13 Claims

1. A process for the preparation of a biureto polyisocyanate, comprising reacting at least one aliphatic, alicyclic or arylaliphatic monomeric diisocyanate with water, at a temperature of at least 70° C. and under an absolute pressure of at least 1.2 bar, including a partial pressure of carbon dioxide of at least 0.2 bar, wherein said water is introduced into the reaction zone to said diisocyanate in liquid form and wherein said water is at least partially in liquid form during the biuretization reaction.

4,983,763

PROCESS FOR PREPARING HIGH TRANS, TRANS-ISOMER CONTAINING 4,4′-DIISOCYANATO DICYCLOHEXYLMETHANE

Stephen D. Seneker, Paden City; Terry A. Potter, and Kenneth L. Dunlap, both of New Martinsville, all of W. Va., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 468,542, Jan. 23, 1990, abandoned. This application Apr. 19, 1990, Ser. No. 511,155

Int. Cl.[5] C07C *263/20*

U.S. Cl. 560—352 3 Claims

1. A process for the preparation of a 4,4′-diisocyanato dicylohexylmethane containing at least 90% by weight of the trans,trans-isomer comprising:

(a) melting a mixture of 4,4′-diisocyanato dicyclohexylemthane isomers containing at least 30% by weight of the trans,trans-isomer,

(b) cooling the melted mixture to a temperature of from about 20° C. to about 25° C. to form:

(1) a liquid phase which contains from about 18 to about 25% by weight of the trans,trans-isomer, and

(2) a solid phase which contains from about 70% to about 85% by weight of the trans,trans-isomer,

(c) removing said liquid phase,

(d) dissolving said solid phase in a solvent to form a 4,4′-diisocyanato discyclohexylmethane-containing solution,

(e) allowing said solution to remain at room temperature for a time sufficient to form:

(1) a solid phase containing at least 90% by weight of the trans,trans-isomer, and

(2) a liquid phase containing said solvent and a mixture of 4,4′-diisocyanato dicyclohexylmethane isomers containing from 30% to 70% by weight of the trans,trans-isomer, and

(f) removing said solid phase (e)(1).

4,983,764

PROCESS FOR PREPARING N-PHOSPHONOMETHYL-GLYCINE

Jeno Pelyva; László Lendvai, both of Füzfogyártelep; Sándor Bálint, Balatonalmádi; Zoltán Kolonics, Balatonalmádi; Csaba Söptei, Veszprém; Sándor László, Füzfogyartelep; Béla Karácsonyi, Budapest; Jánosné Benczik, Balatonalmádi; Csaba Kayos, and Sándor Silye, both of Veszprém, all of Hungary, assignors to Nitrokemia Ipartelepek, Hungary

Filed Oct. 24, 1989, Ser. No. 426,106

Claims priority, application Hungary, Nov. 2, 1988, 5676/88

Int. Cl.[5] C07F *9/38*

U.S. Cl. 562—17 6 Claims

1. Process for preparing N-phosphonomethyl-glycine by oxidizing N-phosphonomethyl-imino-diacetic acid in aqueous-sulphuric acidic medium with hydrogen peroxide which comprises using as oxidation medium a waste acid liquor formed during the process and obtained after the separation of N-phosphonomethyl-glycine.

4,983,765

PROCESS TO SEPARATE MIXTURES OF ENANTIOMERIC ARYLPROPIONIC ACIDS

Helmut Lukas, Neu-Isenburg; Otto Schuster, Bad Soden, and Gunther Rau, Kriftel, all of Fed. Rep. of Germany, assignors to PAZ Arzneimittel-Entwicklungsgesellschaft mbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 27, 1989, Ser. No. 372,088

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824353

Int. Cl.[5] C07B *57/00*

U.S. Cl. 562—401 15 Claims

1. A process to separate a mixture of enantiomers of an arylpropionic acid and to obtain a desired enantiomeric form of the acid, comprising: reacting the mixture with a chiralic base in an inert polar solvent to produce a diastereoisomeric salt, wherein the chiralic base is a member selected from the group consisting of phenylethyl amine, quinoline alkaloid and ephedrine base; purifying the diastereoisomeric salt by multiple crystallization; splitting the purified diastereoisomeric salt in dilute mineral acid; and removing the desired enantiomer from the diastereoisomeric salt.

4,983,766

OPTICALLY ACTIVE B HYDROXY ACIDS

Rene Imwinkelried, Fiesch, and Dieter Seebach, Zurich, both of Switzerland, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 906,736, Sep. 9, 1986, Pat. No. 4,812,476. This application Dec. 23, 1988, Ser. No. 288,877

Claims priority, application United Kingdom, Oct. 17, 1985, 8525666

Int. Cl.[5] C07C *59/48*

U.S. Cl. 562—470 5 Claims

1. An optically active compound of the formula (VI):

$$R^1R^2CHOCH(CH_3)CH_2COOH \quad (VI)$$

or derivative thereof, wherein R^1 is aryl C_{1-4} alkyl or aryl (C_{2-4}) alkenyl substituted by at least one member of the group consisting of C_{1-10} alkyl, C_{2-10} alkenyl, C_{1-10} alkyl amino, di(C_{1-10}) alkyl amino, amino, hydroxy, C_{1-10} alkoxy, mercapto, C_{1-10} alkylthio, halo, nitro, and carboxy, and R^2 is C_{1-6} alkyl, C_{2-6} alkynyl or cyano.

4,983,767

PREPARATION OF ALIPHATIC CARBOXYLIC ACIDS BY OXIDATION OF MONOCYCLIC KETONES

Jean-Marie Bregeault, Boussy Saint-Antoine; Bassam El-Ali, Paris Cedex, and Jacques Martin, Orsay, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Aug. 15, 1989, Ser. No. 393,803

Claims priority, application France, Aug. 16, 1988, 88 11075

Int. Cl.[5] C07C *51/245*

U.S. Cl. 562—528 15 Claims

1. A process for the preparation of an aliphatic carboxylic acid, comprising oxidizing a monocyclic ketone with molecular oxygen or an oxygen-containing gas, in the presence of a catalytically effective amount of a vanadium compound having one of the following formulae (I) and (II):

$$H_{3+n}[PM_{12-n}V_nO_{40}].yH_2O \quad (I)$$

$$VO(Y)_m \quad (II)$$

in which n is an integer greater than or equal to 1 and less than or equal to 6; M is a molybdenum or tungsten atom; y is an integer ranging from zero to less than 50; Y is an acetylacetonate group or an alkoxy radical containing from 1 to 10 atoms; and m is 2 or 3.

4,983,768

PROCESS OF PREPARATION OF PHOSPHINAMIDES APPLICATIONS AND NEW PRODUCTS

Sylvain Juge, Puteaux, France, assignor to Societe Nationale Elf Aquitaine, France

Continuation-in-part of Ser. No. 448,370, Dec. 9, 1982, abandoned. This application Jul. 15, 1985, Ser. No. 754,956

Claims priority, application France, Dec. 11, 1981, 8123153; Dec. 3, 1982, 82 20264

Int. Cl.[5] C07F *9/02*

U.S. Cl. 564—12 14 Claims

1. Process for the preparation of a phosphinamide, characterized in that an organic halide is reacted with an oxazaphospholidine in the absence of air and of humidity and in which the reaction is carried out in the absence of light.

4,983,769

NEW PERFLUOROALKYLAMINE OXIDES AND USE OF THESE PRODUCTS IN FIRE EXTINGUISHING COMPOSITIONS

Rene Bertocchio, Vourles par Vernaison; Louis Foulletier, Oullins, and Andre Lantz, Vernaison, both of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

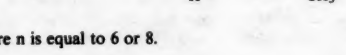
Continuation of Ser. No. 567,613, Jan. 4, 1984, abandoned, which is a continuation of Ser. No. 428,672, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 226,557, Jan. 21, 1981, abandoned. This application Jan. 25, 1988, Ser. No. 147,667

Claims priority, application France, Feb. 29, 1980, 80 04519

Int. Cl.[5] A62C *1/10, 1/12*

U.S. Cl. 564—96 9 Claims

1. A surface-active composition containing, as a surface-active agent, a perfluoralkyl amine oxide having the formula:



where n is equal to 6 or 8.

4,983,770

SUBSTITUTED HYDROXYLAMINE ESTER STABILIZERS

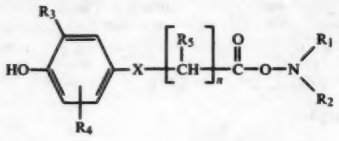
Ramanathan Ravichandran, Yonkers, N.Y., and Stephen D. Pastor, Basel, Switzerland, assignors to Ciba-Geigy Corporation, New York, N.Y.

Division of Ser. No. 114,992, Oct. 26, 1987, Pat. No. 4,888,444. This application Oct. 12, 1989, Ser. No. 420,192

Int. Cl.[5] C07C *291/00*

U.S. Cl. 564—300 9 Claims

1. A compound of the formula



wherein

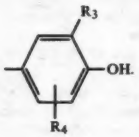
n is 0–2;

X is —S— or —CH_2S—;

R_1 and R_2 independently are hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, allyl, aryl, aralkyl of 7 to 9 carbon atoms, said aralkyl substituted by alkyl of 1 to 36 carbon atoms, or R_1 and R_2 together with the nitrogen atom can form a 5–7 membered heterocyclic ring;

R_3 and R_4 independently are alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, alkaryl of 7 to 18 carbon atoms or aralkyl of 7 to 9 carbon atoms; and

R_5 is hydrogen or the group



4,983,771

METHOD FOR RESOLUTION OF D,L-ALPHA-PHENETHYLAMINE WITH D(−)MANDELIC ACID

William Bryker, Hudsonville, and Luis A. Avila, Holland, both of Mich., assignors to Hexcel Corporation, Dublin, Calif.

Filed Sep. 18, 1989, Ser. No. 408,290

Int. Cl.[5] C07B *57/00*

U.S. Cl. 564—304 9 Claims

1. In a process for the optical resolution of a racemic mixture of D, L(−+)-α-phenethylamine (PEA), wherein said PEA is added to a solution of a solvent and D(−)mandelic acid to form a D(+)α-PEA-mandelate salt, which is recovered from said solution broken with a base and extracted with an organic solvent, the improvement comprising:

using, as said solvent, a water/acid solution, said water/acid solution containing sufficient acid to combine with substantially all L(−)PEA introduced to said solution, and wherein the amount of mandelic acid employed as a resolving agent is the molar equivalent of substantially all D(+)α-PEA added to said solution.

4,983,772

2,6-DISUBSTITUTED ANILINES

William A. Kleschick, Martinez; Mark J. Costales, Concord, both of Calif.; Robert J. Ehr, Eden Prairie, Minn.; Ben C. Gerwick, III, Clayton, Calif.; deceased Meikle, late of Walnut Creek, Calif.; by Diane L. Meikle, executrix, Alamo, Calif.; William T. Monte, Concord, Calif., and Norman R. Pearson, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 261,460, Oct. 21, 1988, Pat. No. 4,886,883, which is a division of Ser. No. 940,480, Dec. 10, 1986, Pat. No. 4,818,273, which is a continuation-in-part of Ser. No. 768,393, Aug. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 551,758, Nov. 14, 1983, abandoned. This application Sep. 13, 1989, Ser. No. 406,666

Int. Cl.[5] G07C *85/11*

U.S. Cl. 564—442 2 Claims

1. The compound 2-methoxy-6-trifluoromethylaniline.

4,983,773

PREPARATION OF BIS-(4-CHLOROPHENYL) SULFONE

Michael Stumpp, Deidesheim; Peter Neumann, Mannheim, and Heinz Eilingsfeld, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 5, 1989, Ser. No. 417,448

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1988, 3835562

Int. Cl.[5] C07C *147/06*

U.S. Cl. 568—034 3 Claims

1. A process for the preparation of bis-(4-chlorophenyl) sulfone by reacting chlorobenzene with sulfuric acid at from 200° to 250° C., wherein a condensing agent selected from the group consisting of boric acid and trifluoromethanesulfonic acid is added.

4,983,774

PREPARATION OF KETONES BY THE ACYLATION OF ORGANO-MANGANOUS COMPOUNDS

Gérard Cahiez, Paris; Blandine Laboue, Paris Cedex, and Pierre Tozzolino, Morlaas, all of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Dec. 16, 1988, Ser. No. 285,713

Int. Cl.[5] C07C *45/45*

U.S. Cl. 568—319 16 Claims

1. A method of producing a ketone comprising reacting an acylation agent selected from the group consisting of acid halides of formula R'COX and mixed acid anhydrides of the formulas $(R'CO)_2O$, R'COOCOR" and R'COOCOOR" with an organo manganous compound selected from the group consisting of compounds of the formulas, RMnCl, $R_3MnMgCl$, $R_4Mn(MgCl)_2$, where R, R' and R" are organic groups, in an organic solvent, the reaction medium being kept at a temperature of from −55° C. to ambient temperature until a substantial amount of ketone is formed, 1 to 10 moles of a cuprous compound selected from the group consisted of cuprous chloride, bromide, acetate, propionate and stearate per 100 moles of said organo maganous compound being added, while mixing said organo maganous compound with said organic mono-acid chloride or said mixed anhydride, and separating the ketone produced from the reaction mixture.

4,983,775

NOVEL SUBSTANCES KS-504A, KS-504B, KS-504D AND KS-504E AND PROCESS FOR THEIR PREPARATION

Satoshi Nakanishi; Koji Yamada; Katsuhiko Ando, all of Tokyo; Isao Kawamoto, Hiratsuka; Toru Yasuzawa; Hiroshi Sano, both of Tokyo; Noriaki Hirayama, Zama; Hiroshi Kase, Tokyo; Joji Goto, Tokyo, and Etsuyo Shimizu, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

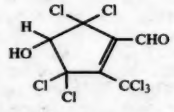
Division of Ser. No. 181,702, Apr. 14, 1988, Pat. No. 4,912,132. This application Jan. 16, 1990, Ser. No. 465,893

Claims priority, application Japan, Apr. 15, 1987, 62-92815

Int. Cl.[5] C07C *47/40*

U.S. Cl. 568—446 2 Claims

1. A compound represented by the formula (III):



(III)

4,983,776

PROCESS FOR THE PREPARATION OF FUNCTIONAL FLUORO DERIVATIVES

Sylvie Benefice-Malouet; Hubert Blancou, both of Montpellier, and Auguste Commeyras, Clapiers, all of France, assignors to Societe Atochem, Puteaux, France

Filed Apr. 27, 1989, Ser. No. 343,743

Claims priority, application France, May 4, 1988, 88 06000

Int. Cl.[5] C07C *45/00, 45/43*

U.S. Cl. 568—490 10 Claims

1. Process for the preparation of fluoro aldehydes, ketones or amides, comprising reacting a linear or branched C_2–C_{20} perfluoroalkyl iodide R_fI over a zinc-copper metal couple, in the presence of a radical initiator selected from azobisisobutyronitrile, 4,4'-azobis(4-cyanovaleric)acid and ethyl chloroformate, with an amide $RCONR_1R_2$, where R denotes a hydrogen atom or a methyl or ethyl radical, and each of R_1 and R_2 denotes a C_1–C_4 alkyl radical.

4,983,777

DIISOPROPYLBIPHENYL MONO- AND DI-HYDROPEROXIDES, PROCESS FOR THE PREPARATION THEREOF, AND COMPOUNDS DERIVED THEREFROM

Dale E. Van Sickle, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 189,931, May 3, 1988, abandoned. This application Nov. 6, 1989, Ser. No. 431,957

Int. Cl.[5] C07C *409/00*

U.S. Cl. 568—568 2 Claims

1. The compound 4,4'-diisopropylbiphenyl dihydroperoxide.

4,983,778

ALKOXYLATION PROCESS USING A CATALYST COMPOSITION CONTAINING ESTERS OF TITANIC ACID AND ZIRCONIC ACID

Uwe Ploog, Haan, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,037

Claims priority, application Fed. Rep. of Germany, May 2, 1988, 3814849

Int. Cl.[5] C07C *41/03*

U.S. Cl. 568—618 3 Claims

1. In a process wherein compounds containing active H atoms are reacted with ethylene oxide, propylene oxide, or mixtures thereof, at an elevated temperature, in the presence of a catalyst to produce an alkoxylated product, the improvement which comprises: using as the catalyst a homogeneous catalyst composition comprising

a. at least one ester selected from the group consisting of esters of titanic acid or zirconic acid with at least one monohydroxy alcohol having from 1 to about 4 carbon atoms, and

b. at least one member selected from the group consisting of sulfuric acid, alkanesulfonic acids having from 1 to about 6 carbon atoms and hydroxyarylsulfonic acids.

4,983,779

PROCESS FOR THE PREPARATION OF VINYL ETHERS

Arthur P. Schaap, Detroit, Mich., assignor to The Board of Governors of Wayne State University, Detroit, Mich.

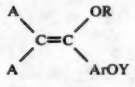
Continuation-in-part of Ser. No. 289,837, Dec. 27, 1988, which is a continuation-in-part of Ser. No. 887,139, Jul. 17, 1986. This application Dec. 14, 1989, Ser. No. 450,459

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] C07C *41/18*

U.S. Cl. 568—660 16 Claims

1. A process for producing a compound of the formula



wherein A and R are passive organic groups, wherein ArOY is an aryl group having an aryl ring substituted with OY as a substituent selected from hydroxyl and OP, wherein P is a protecting group which comprises:

reacting a carbonyl containing compound of the formula:

with an ester compound of the formula:

group in an organic solvent in the presence of a metallic reducing agent, a titanium salt and an amine base to produce the vinyl ether.

4,983,780

BRANCHED PERFLUOROALKYL HALIDES AND PREPARATION

Claudio Tonelli, Concorezzo, and Vito Tortelli, Milan, both of Italy, assignors to Ausimont S.r.l., Milan, Italy

Filed Sep. 19, 1989, Ser. No. 410,472

Claims priority, application Italy, Sep. 20, 1988, 22005 A/88

Int. Cl.[5] C07C *17/22, 17/24, 17/33, 19/08*

U.S. Cl. 57—137 6 Claims

1. Branched perfluoroalkyl halides having a tertiary carbon atom bound to the halogen atom and having the formula:

wherein X is I, Cl, or Br; R_1, R_2, R_3, like or different from one

another, are straight or branched perfluoroalkyl radicals having 1 to 5 carbon atoms, provided that R_1, R_2, R_3 cannot all be $-CF_3$, and that if $R_1=R_2=-CF_3$, and X=I, R_3 cannot be $-CF_2-CF_3$ or $-CF_2-CF_2-CF_3$.

4,983,781

PROCESS FOR THE PREPARATION OF 4,4'-DIBROMOBIPHENYL IN A SOLVENT MEDIUM AND WITH A CATALYST

Jean-Roger Desmurs, Saint Symphorien D'Ozon, and Alain Nonn, Sainte Foy Les Lyon, both of France, assignors to Rhone Poulenc Chimie, Courbevoie, France

Filed Feb. 23, 1989, Ser. No. 314,133

Claims priority, application France, Mar. 2, 1988, 88 02608

Int. Cl.[5] C07C *17/12, 25/18*

U.S. Cl. 570—210 **14 Claims**

1. A process for the preparation of 4,4'-dibromobiphenyl comprising the step of reacting biphenyl with bromine in a solvent and in the presence a catalytic system based on at least one component selected from the group consisting of Lewis acids and iodine.

4,983,782

PROCESS FOR TREATING WASTES AND THE LIKE BY LOW TEMPERATURE CARBONIZATION AND FURTHER PROCESSING OF THE LOW TEMPERATURE CARBONIZATION OIL

Ludwig Merz, Recklinghausen; Klaus Niemann, Oberhausen, and Hans-Peter Wenning, Raesfeld, all of Fed. Rep. of Germany, assignors to Veba Oel Entwicklungs-Gesellschaft mbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 315,856

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806365

Int. Cl.[5] C07C *1/00, 5/00*

U.S. Cl. 585—240 **24 Claims**

1. A process for treating waste, comprising the step:

(i) hydrogenating, in the liquid phase, a liquid product of low temperature carbonization of a waste, in the presence of 0.5 to 5% by weight of a catalyst, based on the total weight of the hydrogenation mixture, under a hydrogen pressure of 20 to 325 bar, at a temperature of 250 to 500° C., and with a gas to liquid ratio of 100 to 3,000 Nm^3/t, wherein said liquid product of low temperature carbonization contains at least one member selected from the group consisting of polycyclic aromatic hydrocarbons and chlorinated hydrocarbons.

4,983,783

REDUCTION IN CARBON OXIDES IN OXIDATIVE PYROLYSIS OF HALOGENATED METHANES

Selim M. Senkan, Chicago, Ill., assignor to Illinois Institute of Technology, Chicago, Ill.

Filed Jul. 25, 1989, Ser. No. 385,009

Int. Cl.[5] C07C *1/00*

U.S. Cl. 585—641 **26 Claims**

1. A method of reducing product carbon oxides in a process oxidatively pyrolyzing halogenated methanes under non-flame conditions in the presence of an oxygen containing gas to produce higher molecular weight hydrocarbons with effective suppression of formation of carbonaceous deposits, said method comprising introducing only a minor portion of oxygen to said process upstream of maximum ethylene formation.

ELECTRICAL

4,983,784

CABLE TERMINATION APPARATUS AND METHOD

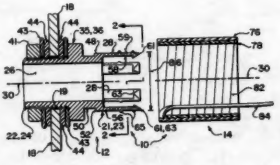
Ronald K. Whitlock, 19922-70th Avenue, Langley, British Columbia, Canada (V3A 4P 7)

Filed Apr. 26, 1989, Ser. No. 343,376

Claims priority, application Australia, May 13, 1988, PI8217

Int. Cl.[5] F16L *41/00*

U.S. Cl. 174—65 SS **19 Claims**



1. An apparatus for connecting a cable to an item, the apparatus comprising:

(a) a body having aligned first and second portions having respective outer peripheries, the first and second portions having axially aligned openings for receiving the cable passed therethrough, the first portion having a plurality of flexible fingers disposed on the periphery thereof to extend around the cable,

(b) an elastic cover assembly positionable on the body to enclose at least the fingers of the first portion, the cover assembly comprising an elastic sleeve and a hollow core member, the sleeve initially being supported in a stretched condition on the hollow core member which is removeable to permit the sleeve to collapse onto the fingers.

4,983,785

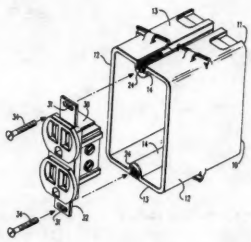
ELECTRICAL WIRING BOX WITH STRUCTURE FOR FAST DEVICE MOUNTING

Earl S. Johnston, Mineral Wells, W. Va., assignor to Challenger Electrical Materials, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 279,481, Dec. 2, 1988, abandoned. This application Mar. 2, 1989, Ser. No. 318,106

Int. Cl.[5] H02G *3/08*

U.S. Cl. 174—53 **15 Claims**



1. An electrical wiring box, of molded insulating material and designed for rapid and secure mounting of a device in the box, comprising:

a boss integrally formed with a wall of the box and having a screw hole for receiving a predetermined size mounting screw at a front surface of said boss,

said screw hole having two colinear portions of which a first portion proximate said front surface has an internal configuration that engages the mounting screw while permitting the mounting screw to be longitudinally inserted therethrough without turning and a second portion of greater restriction for securely engaging the screw,

said boss having a first center slot extending from said screw hole to the boss exterior over a length substantially equal to said first colinear portion of said screw hole, second and third slots located respectively on each side of, and spaced from said screw hole,

said first, second and third slots being substantially parallel, and providing hinged projections respectively between said first and second slots and said first and third slots that flex to allow easy screw insertion through said first portion of said screw hole.

4,983,786

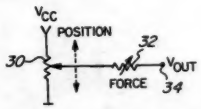
XY VELOCITY CONTROLLER

Stevens David R., Vancouver, and Andrea Marziali, North Vancouver, both of Canada, assignors to The University of British Columbia, Vancouver, Canada

Filed Jan. 17, 1990, Ser. No. 466,488

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **10 Claims**



1. A XY control system for selecting direction and magnitude of velocity in said selected direction of a controlled means comprising a XY digital pad generating different signals depending on a selected activated location on said pad, electrical circuit means dividing said signals into a datum signal when said activated location on said pad is in a datum zone on said pad, a X signal when said activated location is displaced in a first direction from said datum zone, a Y signal when said activated location is displaced in a second direction perpendicular to said first direction from said datum zone and directional signals for said X and Y signals based on the side of said datum zone in said first and second directions respectively that said activated location is positioned on said pad, said electrical circuit means converting said X and Y signals into velocity signals proportional to the displacement of said activated location relative to said datum zone, and further electrical circuit means controlling said direction and magnitude of said velocity of said controlled means in accordance with said directional and said velocity signals.

4,983,787

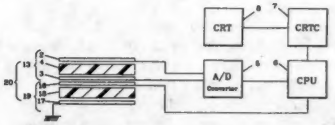
COORDINATE INPUT UNIT

Takahiro Kunikane, 2335 Komuro Inamachi, Saitama-ken, Japan

Filed Aug. 10, 1988, Ser. No. 230,615

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **48 Claims**



1. A coordinate input unit for converting and detecting a pressing position in accordance with the coordinate to be applied into an electric signal, said coordinate input unit comprising a coordinate input pad in which one or more pairs of sheet-like electrodes for a function switch held by a pressure-sensitive, electroconductive sheet having weighed input sensitivity different from that of another pressure-sensitive, electroconductive sheet is laminated on a pair of flexible, sheet-like electrode groups for coordinate input having a plural number

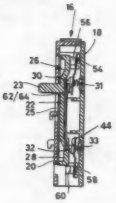
of electrodes in accordance with the pressing position and which is held by the latter pressure-sensitive, electroconductive sheet.

4,983,788

ELECTRIC SWITCH MECHANISM FOR RELAYS AND CONTACTORS

Franco P. Pardini, Milan, Italy, assignor to CGE Compagnia Generale Electtromeccanica S.p.A., Milan, Italy

Filed Jun. 21, 1989, Ser. No. 369,531
Claims priority, application Italy, Jun. 23, 1988, 21478/88[U]
Int. Cl.[5] H01H *15/02, 67/02*
U.S. Cl. 200—16 R 4 Claims



1. Electric switch mechanism for relays and contactors, comprising:

a plurality of contacts, wherein each contact is a double interruption contact which can be normally open or normally closed;

an insulating housing;

a slidable actuating member which is movable between two end positions by a movable part of a relay or a contactor;

said insulating housing accommodating said actuating member and said contacts, said actuating member being an insulating member actuated externally of said housing and including cam means thereon;

spring members located in said housing;

each contact including a movable portion; and

contact carrying means acted upon by said spring members and carrying said movable portions of said contacts;

said actuating member including a slider, said cam means being cams formed on an inner face of said slider, said contact carrying means including conducting bridges connecting at least two movable contact portions, said bridges being pivotably supported in said housing, said spring members forcing said bridges to engage against said cams;

each bridge being substantially T-shaped and having a first cross-arm carrying said movable contact portions and a protrusion cooperating with a respective one of said cams, and a second arm provided with a fulcrum abutting against said housing;

fixed arms connected to said housing and carrying fixed contact portions, said fixed arms terminating with screw clamps for connection with external circuits;

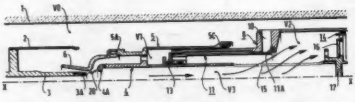
said cam means, upon an axial movement of said actuating member from one of said end positions to another of said end positions, acting on said contact carrying means to move said movable portions relative to said fixing portions against a force of said spring members, so that opening and closure of said contacts are obtained by the axial movement of said actuating member, and wherein a force required for said axial movement is substantially due to friction forces caused by said spring members supplying a contact force between the respective movable and fixed portions.

4,983,789

HIGH- AND MEDIUM-VOLTAGE GAS CIRCUIT BREAKERS

Edmond Thuries, Meyzieu, France, assignor to GEC Alsthom SA, Paris, France

Filed Jan. 2, 1990, Ser. No. 459,893
Claims priority, application France, Jan. 2, 1989, 89 00009
Int. Cl.[5] H01H *33/88*
U.S. Cl. 200—148 A 5 Claims



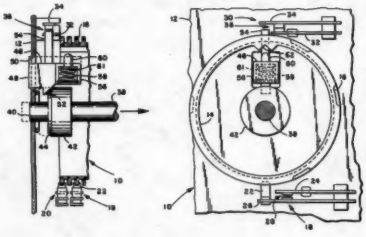
1. High- and medium-voltage gas circuit breaker comprising a cylindrical electrically insulative casing adapted to be filled with dielectric gas under pressure, a fixed main contact, a fixed arc contact, a mobile assembly adapted to be coupled to an operating member and comprising a mobile main contact, a mobile arc contact and a blow-out cylinder associated with a blow-out nozzle and cooperating with a first piston, a second piston fastened to said mobile assembly and a fixed second cylinder in which said second piston slides, wherein said second piston has a large cross-section in relation to the cross-section of said blow-out cylinder, is associated with means for providing low head loss communication with the arc area and comprises orifices of calibrated size to limit the pressure on the face of said piston on which the gas heated by the arc impinges.

4,983,790

ELECTROMECHANICAL PROGRAMMER ASSEMBLY

Richard C. Bogda, Elmhurst, and George D. Georgacakis, Skokie, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 28, 1989, Ser. No. 386,371
Int. Cl.[5] H01H *43/10*
U.S. Cl. 200—30 R 14 Claims



1. A combination line switch and cam position indicator assembly for an electromechanical programmer comprising:

(a) a cam drum rotatably mounted on a base means having at least one program cam track provided thereon, said drum adapted for motorized advancement;

(b) at least one program function switch disposed for actuation by said cam track;

(c) means defining a detent surface on said cam drum;

(d) a line switch adapted for series connection with an advancement motor for said cam, said switch having a stationary blade and a movable blade operable upon movement to break and make a set of contacts adapted for connection to to said motor;

(e) a shaft rotatably disposed on said base means movable axially between a first and second position, said shaft in said second position operable upon user rotation to effect

rotation of said cam drum to any of a plurality of selected positions;

(f) a switch cam means associated with said shaft and movable therewith;

(g) switch actuator means disposed for contact with said switch cam means and movement with respect to said cam drum between a first and second position, said actuator means operable in said first position to move said movable switch blade for breaking said contact set and, said actuator means operable in said second position to permit said movable switch blade to close said contact set; and

(h) detent means operable to engage said detent second position and operably disengaged when said actuator means is in said first position.

4,983,791

HIGH TENSION CIRCUIT BREAKER HAVING A DIELECTRIC BLAST GAS

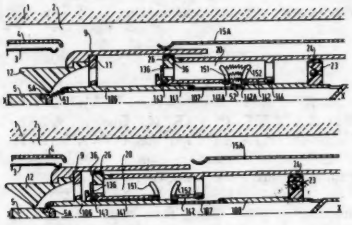
Edmond Thuries, Meyzieu; Denis Dufournet, Bron, and Michel Perret, Bourgoin-Jallieu, all of France, assignors to GEC Alsthom S.A., Paris, France

Filed May 31, 1990, Ser. No. 531,367

Claims priority, application France, May 31, 1989, 89 07179

Int. Cl.[5] H01H *33/88*

U.S. Cl. 200—148 A **9 Claims**



1. A high tension circuit breaker insulated by an arc blasting dielectric gas and comprising, inside a gastight insulating housing:

a fixed assembly comprising, in particular, a fixed main contact and a fixed arcing contact;

a moving assembly driven by a drive rod and including, in particular, a moving main contact and a moving arcing contact;

a blast volume extended by a blast nozzle;

a blast piston; and

a pair of secondary contacts disposed inside a first volume and intended to generate a secondary arc;

wherein the circuit breaker further comprises first means for reducing the risks of unwanted arcs being struck due to the secondary arc, said means being constituted by a jacket of insulating material extending level with the secondary contacts and in sliding contact with at least a portion of one of the sliding contacts, said jacket having longitudinal grooves adjacent to said secondary contact.

4,983,792

INTERRUPTER SWITCH WITH SELECTIVE CIRCUIT-ISOLATING FEATURE

Edward J. Rogers, Chicago; Leonard V. Chabala, Maywood, and Joel A. Ramos, Chicago, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

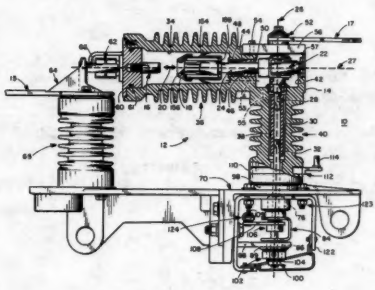
Filed Mar. 30, 1989, Ser. No. 331,216

Int. Cl.[5] H01H *33/42, 33/70*

U.S. Cl. 200—148 F **18 Claims**

1. An electrical interrupter switch comprising:

means for interrupting current in a path between two circuit and for selectively thereafter providing additional circuit isolation via physical separation with respect to a first of the two circuit terminals, said interrupting means including separable interrupting contacts, means for separating said separable interrupting contacts, and means for electrically connecting each of said separable interrupting contacts to a respective one of the two circuit terminals, said electrical connecting means including means being selectively disconnectable and physically separable from the first of the two circuit terminals;



means for housing and supporting said interrupting means; and

means independent of said separating means for moving said housing means as a movable switching member so as to perform said selective additional circuit isolation only after interruption of said current path.

4,983,793

SWITCH CHAMBER FOR A VACUUM SWITCH

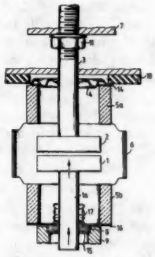
Karl Stegmüller, Wiesent, Fed. Rep. of Germany, assignor to Sachsenwerk Aktiengesellschaft, Regensburg, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 390,394

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 8810063

Int. Cl.[5] H01H *33/66*

U.S. Cl. 200—144 B **14 Claims**



1. In a switch chamber for a vacuum switch, including: a housing having at least one insulating tube with an end face and an axial axis; a contact pin having an exterior surface and arranged for supporting the switch chamber; a stationary contact held by the contact pin within the housing and having a frontal face; a movable contact contacting the frontal face of the stationary contact in the on-position of the vacuum switch under the force of a contact spring; sealing means including a bellows for connecting the movable contact with the housing in a vacuum-tight manner; a terminating cover connected to the insulating tube and to the contact pin in a vacuum-tight

manner and transferring to the housing impact forces generated when the vacuum switch is switched on, the improvement wherein:

said insulating tube comprises a ceramic tube; and said terminating cover comprises chromium-nickel steel having a wall thickness of no more than 1 mm and has a corrugated shape including at least one full corrugation, said termination cover further having an outer cut edge fastened to the end face of said ceramic tube and an inner cut edge fastened to the exterior surface of said contact pin.

4,983,794

SNAP ACTION SWITCHING DEVICE

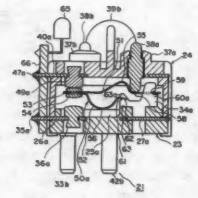
Sadao Kokubu, Niwa, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jul. 25, 1989, Ser. No. 384,989

Claims priority, application Japan, Jul. 26, 1988, 63-187714; Aug. 5, 1988, 63-104276[U]

Int. Cl.[5] H01H *5/18*

U.S. Cl. 200—461 **16 Claims**



1. A snap action switching device, comprising:

a first movable member consisting of a plate spring member, one end of which is formed as a free end portion and the other end of which is supported by a first support portion;

a second movable member consisting of a plate spring member, one end of which is formed as a free end portion facing the free end portion of said first movable member, the other end of which is supported by a second support portion situated nearer to the free end portions than said first support portion, and a middle portion of which is formed as a curved portion that is convex in a direction away from said first movable member;

a moving contact portion provided at the free end portions of said first and second movable members;

an operating member which is capable of displacing said first movable member by depressing said first movable member at a position near the supported end thereof in a direction toward said second support portion; and

fixed contact portions which are touched or separated from said moving contact portion in accordance with the displacement of said first movable member;

said first movable member having a curved portion near its supported end which is convex in a direction away from the second support portion so that said first movable member will not come into contact with said second support portion when said first movable member is depressed by said operating member.

4,983,795

SLIDE SWITCH

Masaru Suzuki, Aichi, Japan, assignor to Kabushiki-Kaisha Tokai-Kika-Denki-Seisakusho, Aichi, Japan

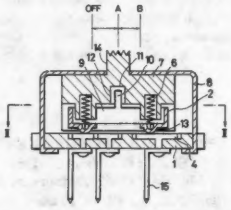
Filed Mar. 30, 1989, Ser. No. 330,478

Claims priority, application Japan, Apr. 7, 1988, 63-47179[U]

Int. Cl.[5] H01H *15/06*

U.S. Cl. 200—550 **16 Claims**

1. A slide switch comprising an insulator, at least one stationary contact member fixed on an upper surface of said insulator, a contact holder slidable on said insulator, a plurality of movable contact members mounted on said contact holder through a contact biasing spring respectively to make sliding electrical contact with said stationary contact member, a connecting member having ends mountable to respective said movable contact members to connect said movable contact members to each other, a casing enclosing said contact holder, said movable contact members comprising side walls and at least one



bottom member disposed substantially orthogonally in relation to respective said side walls, wherein said movable contact members and said connecting member are formed of shape memory alloy so that the side walls of said movable contact members and said connecting member extending substantially orthogonally with respect to said upper surface of said insulator are freely deformable once subjected to heat.

4,983,796

METHOD AND APPARATUS FOR REMOTE WELDING INSIDE A TUBE, IN PARTICULAR IN A STEAM GENERATOR IN A NUCLEAR POWER STATION

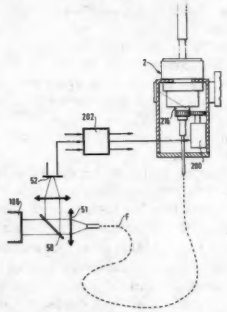
Jacques Griffaton, Chalon-sur-Saone, France, assignor to Framatome, Courbevoie, France

Filed Oct. 16, 1989, Ser. No. 422,171

Claims priority, application France, Oct. 14, 1988, 88 13602

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 **5 Claims**



1. A method of remote welding in a tube, in particular in a steam generator of a nuclear power station, in order to make a connection firstly between a receiver tube having an axis, and secondly a bush to be welded which includes a wall and which has previously been installed in the tube, the method comprising:

an operation of inserting a weld head into said receiver tube, said head including an optical cell which itself comprises:

optical reflection means suitable for receiving a welding light beam along said axis of the receiver tube and for reflecting said beam towards the wall of said bush to be welded; and

focusing means suitable for focusing said beam on an

impact point on the wall of said bush to be welded in such a manner as to weld said bush to said receiver tube at said point;

said method further including an operation of creating such a welding beam by means of a welding laser, said beam being suitable for performing said welding, said laser being situated in a beam creation zone at a distance from said receiver tube; and

an operation of placing a transport optical fiber for receiving said welding beam and for conveying it to said optical cell;

wherein said optical cell is carried by a tubular extender assembly surrounding said transport optical fiber inside said receiver tube and extending to the outside of said tube so as to allow said fiber to move axially inside said extender assembly,

said method further including, after said operations of placing said weld head and said transport fiber and before said operation of injecting the welding beam into the inlet of the transport fiber:

an operation of injecting an adjustment beam, during which operation an adjustment beam of lower power than said welding beam is injected into said inlet of the transport fiber in such a manner as to be transported by said fiber and reflected and focused by said optical cell in order to illuminate said impact point, and to cause a light beam to be returned from said impact point to said inlet to the optical fiber; and

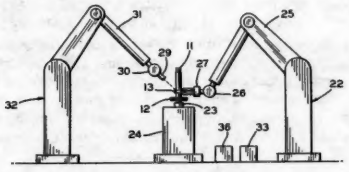
a focus adjustment operation during which the intensity of said returned beam is measured and during which said transport fiber is displaced axially relative to said optical cell until an optimum position is reached in which said intensity reaches a maximum value and/or a predetermined value, said optimum position then being fixed.

4,983,797

METHOD FOR MANUFACTURING A COMPOSITE CAMSHAFT

David K. McAllister, Hagerstown, and Russell E. Hite, Richmond, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 29, 1989, Ser. No. 458,992
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.64 **8 Claims**



1. A method for manufacturing a camshaft comprising the steps of:

(a) utilizing a robot to position a cam lobe at a selected axial and rotative position on a cylindrical shaft; and

(b) securing said cam lobe to said shaft by laser welding.

4,983,798

WARMING DEVICES AND METHOD USING A MATERIAL WITH A SOLID-SOLID PHASE CHANGE

Paul E. Eckler, 2705 Hulman St., Terre Haute, Ind. 47803, and Richard B. Hunt, 1312 Jessamine Rd., Dade City, Fla. 33525

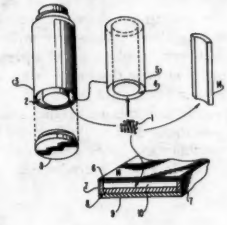
Filed Apr. 18, 1989, Ser. No. 339,779
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 M **12 Claims**

1. A container for foods, said container comprising:

a food storage volume,

a particle storage volume in heat exchange communication with said food storage area, and

discrete particles of a solid organic material that is solid at



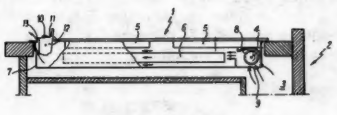
room temperature and exhibits a mesocrystalline transition temperature within a range of about 30° to about 200° C., said organic material being disposed in said particle storage volume.

4,983,799

DEVICE FOR SUPPORTING THE CONTROL MEANS FOR A DOMESTIC APPLIANCE

Jacques Bonnet, Olivet, and Gérard Pressouyre, Le Chateau D'Olonne, both of France, assignors to Compagnie Europeenne pour l'Equipement Menager-Cepem, St. Jean-de-la-Ruelle, France

Filed Dec. 18, 1989, Ser. No. 451,875
Claims priority, application France, Dec. 27, 1988, 88 17219
Int. Cl.[5] H05B *6/12*
U.S. Cl. 219—10.493 **6 Claims**



1. A heating appliance comprising:

an induction-type cooking hob mounted on a housing;

a movable body mounted on said housing, said body comprising a face on which are arranged control knobs, said body being movable between a first position where the knobs are outside the housing and a second position where the knobs are inside the housing;

power electronics for providing power to said cooking hob;

an internal ventilation circuit within the housing for cooling said power electronics;

said body having an air ventilation passage with a first end exiting into the housing and a second end opening outside the housing in the vicinity of the face, said second end constituting an outlet port for said internal ventilation circuit when the body is in the first position, and said internal ventilation circuit being closed by the body when the body is in the second position.

4,983,800

INTERELECTRODE DISTANCE CONTROLLING DEVICE IN ELECTRIC DISCHARGE MACHINING APPARATUS

Atsushi Taneda, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,933
Claims priority, application Japan, Jul. 27, 1988, 63-187407
Int. Cl.[5] B23H *1/00, 7/18*
U.S. Cl. 219—69.16 **3 Claims**

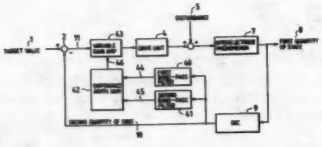
1. A device for controlling an interelectrode distance in an

electric discharge machine comprising a driveable electrode means and a plurality mechanical/electrical systems, each having an operating parameter representing an oscillation frequency of said electric discharge machine, to maintain electric discharge conditions constant comprising:

a drive unit for driving the electrode means;

a detector for detecting a discharge condition parameter to be controlled from a plurality of operating parameters representing an electric discharge condition and for generating a detected output;

a first band-pass filter means having a center frequency which is equal to the oscillation frequency of said electric discharge machine and being responsive to said detected output to generate a first filtered signal;



a second band-pass filter means having a center frequency different from the center frequency of said first band-pass unit and being responsive to said detected output to generate a second filtered signal;

a difference arithmetic unit responsive to said first and second filtered signals for calculating the difference between the detected output representative of the discharge condition parameters and passed through said first and second band-pass units and for identifying said difference as output data; and

a variable gain amplifier which changes the gain thereof according to said output data of said difference arithmetic unit, and amplifies the deviation data of said discharge condition parameter to be controlled from a target value and applies said deviation data to an electrode drive unit.

4,983,801

RAIL TENSIONING APPARATUS

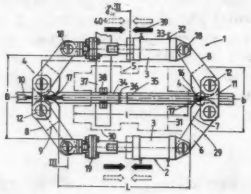
Josef Theurer, Vienna; Johann Hansmann, deceased, late of Klosterneuburg (by Gisela Hansmann, heir); Friedrich Oellerer, Linz, and Leopold R. Gruber, Scheibbs, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 24, 1989, Ser. No. 301,186

Claims priority, application Austria, Feb. 1, 1988, 198/88

Int. Cl.[5] B23K *11/04*

U.S. Cl. 219—54 **26 Claims**



1. An apparatus for tensioning or longitudinally sliding a rail of a laid track consisting of two rails fastened to ties by fastening elements to reduce a gap between adjacent ends of longitudinally successive rail sections to be welded together to form the rail, the fastening elements of the longitudinally successive rail sections having been loosened, which comprises a closed, ring-shaped mechanical structural unit including

(a) two longitudinally spaced pairs of rail clamping jaw means and

(b) two transversely spaced hydraulic cylinder-piston devices for operating the rail clamping jaw means, each device connecting respective rail clamping jaw means or said pairs, combined with

(c) an electrically operated flash butt welding head received in a central space within the ring-shaped mechanical structural unit,

(1) the pairs of rail clamping jaw means being spaced longitudinally and the cylinder-piston devices being spaced transversely to define said central space within the ring-shaped mechanical structural unit for receiving a flash-butt welding head, and

(d) an electrical insulation between the longitudinally spaced pairs of rail clamping jaw means at each side of the rail for interrupting any flow of electrical current between the pairs of rail clamping jaw means.

4,983,802

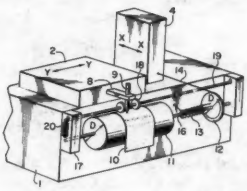
DRAWING SYSTEM IN A WIRE-CUT ELECTRODISCHARGE MACHINE

Kazuo Kobayashi, Sagamihara; Hitoshi Miyahara, Yokohama; Hidemaru Nishikizawa, Hadano; Hironori Shimomoto, and Osamu Maruyama, both of Ebina, all of Japan, assignors to Hitachi Seiko Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,457

Int. Cl.[5] B23H *7/02*

U.S. Cl. 219—69.12 **4 Claims**



1. A drawing system in a wire-cut electrodischarge machine having two rectilinear motion devices arranged at right angles on a base for moving a workpiece and a wire relatively to each other, comprising a writing device, a cylindrical drawing mount supported rotatably on the base, and a motion converter for converting linear movement into rotational movement, the drawing mount being connected via the motion converter to one of the rectilinear motion devices while the writing device is connected to the other of the rectilinear motion devices.

4,983,803

METHOD OF MAKING A SUBSURFACE WELL SAFETY VALVE

Ronald E. Pringle, Houston, and Arthur J. Morris, Magnolia, both of Tex., assignors to Camco International Inc., Houston, Tex.

Division of Ser. No. 404,241, Sep. 7, 1989, Pat. No. 4,926,945.

This application Dec. 11, 1989, Ser. No. 448,429

Int. Cl.[5] B23H *1/00, 7/02, 9/00*; B24B *1/00*

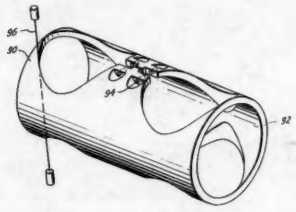
U.S. Cl. 219—69.17 **11 Claims**

8. A method of making an arcuate valve closure member for a subsurface safety valve comprising,

honing the inside of a circular tubular member for providing a finished concave seat surface,

simultaneously cutting first and second circular sectors, each of which includes a hinge, out of the tubular member wherein the second sector is diametrically opposite to the first sector, and

prior to cutting out the sectors, drilling a hole through the tubular member in a circular plane perpendicular to the



axis of the tubular member for forming hinge holes in the cut out valve closure members.

4,983,804

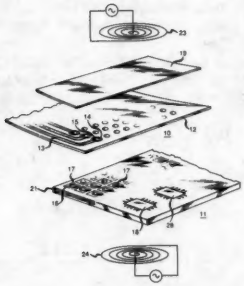
LOCALIZED SOLDERING BY INDUCTIVE HEATING

Hinghung A. Chan, Piscataway, and Michael A. Oien, Chatham, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1989, Ser. No. 454,331

Int. Cl.[5] H05B *6/10*; B23K *1/00*

U.S. Cl. 219—85.11 **13 Claims**



1. A method of selectively soldering conductive elements on an electronic component to conductive elements on a substrate having two major surfaces comprising the steps of:

providing solder to the elements to be soldered;

providing a ferromagnetic material within 0.5 mm of the elements to be soldered, the ferromagnetic material having a Curie temperature in the range 200–400 degrees C and having a saturation field of at least 1 Tesla; and

applying an electromagnetic field with a frequency in the range 5×10^3 to 2×10^5 Hz to the ferromagnetic material by means of a pair of coils detached from the material with a coil opposite each major surface of the substrate so as to inductively heat said material to a temperature sufficient to melt the solder.

4,983,805

FLASHLESS D.C. BUTT WELDING ELECTRODES

George Kengle, Westland, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Sep. 18, 1989, Ser. No. 408,976

Int. Cl.[5] B23K *11/02*

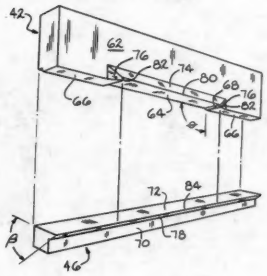
U.S. Cl. 219—101 **14 Claims**

1. A set of first and second electrodes for clamping bar stock having first and second opposed major surfaces separated by a distance D, and first and second opposed minor surfaces,

said first electrode comprising a clamping surface for engaging one of said major surfaces,

said second electrode comprising a clamping surface for engaging the other one of said major surfaces,

said first and second electrodes further comprising containment wall means operable, when the clamping surfaces of



the first and second electrodes are engaged with the first and second opposed major surfaces of bar stock, to define first and second containment walls adjacent to the first and second minor surfaces of the bar stock, and

pinching surfaces associated with the clamping surfaces and the containment walls.

4,983,806

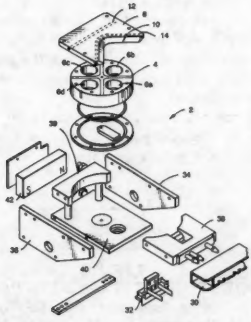
METHOD AND DEVICE FOR COOLING ELECTRON BEAM GUN

James L. Harper, and Charles H. Hill, both of 322 Lindberg Ave., Livermore, Calif. 94550

Filed Mar. 1, 1990, Ser. No. 487,595

Int. Cl.[5] B23K *15/00*

U.S. Cl. 219—121.15 **14 Claims**



1. In an electron beam gun having a rotatable table partially covered by a top plate, said table having a plurality of evaporant pockets, said top plate having an inward edge partially surrounding a first of said pockets, so that said first pocket is upwardly exposed while the other pockets are covered, wherein the improvement comprises:

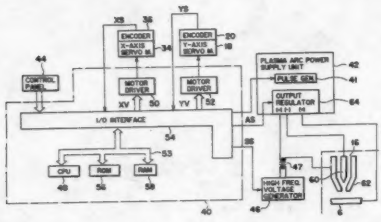
a stream of coolant, said top plate having a channel for passing said coolant, said channel running longitudinally through said top plate adjacent and substantially parallel to said inward edge of said top plate, whereby said inward edge of said top plate is cooled by said coolant.

4,983,807

METHOD AND APPARATUS FOR PLASMA CUTTING A WORKPIECE

Osamu Yamada, Aichi; Hisaaki Yamane, Kasugai, and Kunio Kohsaka, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 29, 1990, Ser. No. 529,480
Claims priority, application Japan, May 29, 1989, 1-137051
Int. Cl.[5] B23K 9/00
U.S. Cl. 219—121.48 8 Claims



1. An apparatus for plasma cutting a workpiece comprising:

a cutting torch having a nozzle and an electrode for producing a plasma arc in accordance with a cutting current supplied to the electrode, said cutting torch being movably disposed relative to the workpiece and cutting the workpiece with the plasma arc;

power supply means for supplying the cutting current to the electrode of said cutting torch, said power supply means including a D.C. current supplying means for supplying a D.C. current, pulse generating means for generating a pulsating current having a frequency, and superimposing means for superimposing the pulsating current on the D.C. current to produce the cutting current;

moving means for moving said cutting torch relative to the workpiece;

storage means for storing cut machining data;

drive control means for numerically controlling said moving means in accordance with the cut machining data read out of said storage means, said moving means moving said cutting torch at a speed relative to the workpiece;

speed detection means for detecting the moving speed of said cutting torch relative to the workpiece and outputting speed data; and

frequency control means responsive to the speed data for varying the frequency of the pulsating current generated from said pulse generating means.

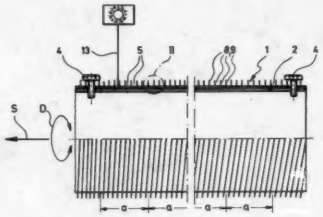
4,983,808

METHOD OF PRODUCING OPENING ROLLER RINGS

Karl-Heinz Schmolke, Neuweiler, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Neubulach, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 374,328
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825739
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.64 8 Claims

1. A method for producing opening roller rings, in particular for open-end spinning machines, comprising the steps of helically winding a saw-tooth wire provided with a foot onto a core having an axis which is several times as long as the length of an opening roller ring, interconnecting the foot portions of neighbouring saw-tooth wire windings so as to form a tube, removing the tube formed of said interconnected saw-tooth wire windings from the core, and dividing the tube formed of



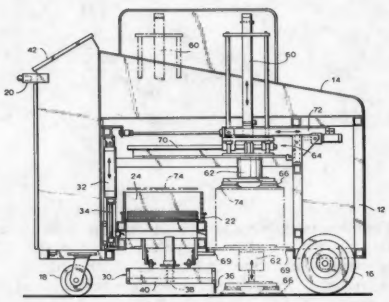
said interconnected saw-tooth wire windings into individual opening roller rings.

4,983,809

RADIANT FLOOR TILE HEATER

Ralph L. Maiette, Wolcott; Stephen T. Starre, East Granby; Dayton C. Thomas, Sandyhook, and Craig E. Crandall, Waterbury, all of Conn., assignors to UAS Automation Systems, Inc., Bristol, Conn.

Filed Aug. 1, 1989, Ser. No. 388,019
Int. Cl.[5] H05B 3/00; B66C 1/02; B65G 49/00
U.S. Cl. 392—407 9 Claims



1. Apparatus for heating, lifting and storing floor tiles intact comprising:

(A) a movable frame for progressive movement over a plurality of tiles to be heated successively, including means for removably receiving a storage container adapted to hold a plurality of tiles;

(B) means mounted on said frame for heating a plurality of tiles on a subfloor to soften the tiles and any thermoplastic adhesive securing the tiles to the subfloor;

(C) means for lifting each of the heated tiles by at least four widely spaced points adjacent the periphery of each heated tile simultaneously, said lifting means comprising in series an upper pneumatic cylinder and a plurality of lower pneumatic cylinders;

(D) means for relocating the lifted tiles into the storage container; and

(E) control means for controlling said heating, lifting and relocating means.

4,983,810

HEATING UNIT WITH THERMOCHROMIC REGION

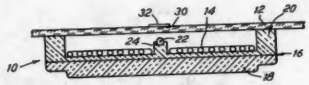
Simon N. Balderson, Reading, England, assignor to Thorn EMI plc, London, England

Filed Apr. 11, 1988, Ser. No. 179,873

Claims priority, application United Kingdom, Apr. 15, 1987, 8709051

Int. Cl.[5] H05B 3/68

U.S. Cl. 219—462 8 Claims



1. A heating unit comprising a heatable surface having at least a region of the heatable surface coated or otherwise provided with a layer incorporating a thermochromic material in sufficient quantity to influence the perceived colour of the layer, the thermochromic material exhibiting an absorption edge wavelength which changes reversibly with temperature in the range of from 20° C. to at least 400° C., the absorption edge wavelength at 20° C. being in the range of from 540 nm to 610 nm, which wavelength progressively increases to a wavelength at 400° C. in the range of from 660 nm to 700 nm.

4,983,811

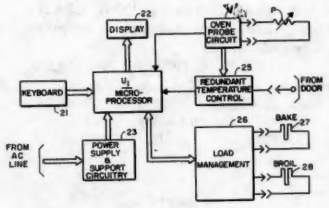
AUXILIARY ELECTRONIC TEMPERATURE CONTROL SYSTEM FOR OVEN

Rick L. Oppor, Hanover Park, and Timothy L. Braun, Lombard, both of Ill., assignors to Appliance Control Technology, Inc., Addison, Ill.

Filed Jun. 16, 1989, Ser. No. 367,863

Int. Cl.[5] H05B 1/02

U.S. Cl. 219—497 12 Claims



1. An auxiliary temperature control circuit for use in an environment normally under control of a primary temperature control system, said auxiliary temperature control circuit comprising:

a first comparator circuit, including connection to a first voltage reference;

a second comparator circuit, including connection to a second voltage reference;

a temperature sensor means, including separate connections to said first and to said second comparator circuits, operated in response to temperature changes to generate a variable voltage reference representative of said changes;

a disable circuit, including input circuit connections from said first comparator circuit, and from said second comparator circuit;

and an output circuit connection to a heat generating means, said disable circuit initially operated in response to said first comaprator circuit, said first comparator circuit generating an output signal over said output circuit connection in response to the voltage generated by said temperature sensor means being of approximately the same magnitude as said first voltage reference to render said heat generating means, unoperated.

4,983,812

CONTROL SYSTEM FOR AN ELECTRIC COOKER

Peter W. Worrall, Ferryhill, and Peter W. Crossley, Durham, both of United Kingdom, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

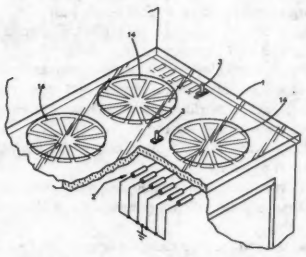
PCT No. PCT/GB88/00937, § 371 Date Aug. 16, 1989, § 102(e) Date Aug. 16, 1989, PCT Pub. No. WO89/04543, PCT Pub. Date May 18, 1989

PCT Filed Oct. 31, 1988, Ser. No. 378,220

Claims priority, application United Kingdom, Nov. 3, 1987, 8725737

Int. Cl.[5] H05B 3/68

U.S. Cl. 219—451 8 Claims



1. A control system for an electric cooker having a planar glass ceramic hob (1) under which is disposed at least one heater element (14), the control system comprising an array (2) of magnetic field sensitive switches positioned beneath the hob (1), said heater element being de-energized when said switches are open, marking means visible from the upper surface of the hob (1) indicating the position of the switches of the array (2), and an actuator key (3) comprising a permanent magnet (16) and having a planar bottom surface which can rest on and slide over the surface of the hob (1) such that, when and only when the actuator key (3) is positioned over one of the switches of the array (2), that and only that switch is closed.

4,983,813

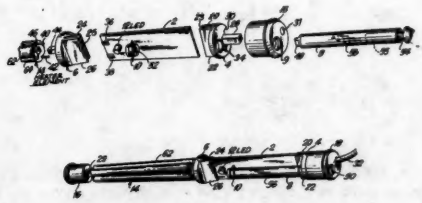
SUBMERSIBLE AQUARIUM HEATER WITH ADJUSTABLE ELECTRONIC THERMOSTATIC CONTROL

Anthony Van Tulleken, London, and David Johnson, Harts, both of United Kingdom, assignors to Interpet Ltd., Surrey, England

Filed Jun. 6, 1989, Ser. No. 362,169

Int. Cl.[5] H05B 1/02, 3/80; A01K 63/06

U.S. Cl. 219—523 14 Claims



1. Thermostatic heater apparatus comprising:

electric resistance heater means;

mounting means;

electronic thermostat means mounted on said mounting means for generating an energizing signal whenever temperature sensed thereby falls below a selected temperature setting, said electronic thermostat means including means for sensing temperature, adjustable means for establishing a selected temperature setting, and switch means responsive to said signal for energizing said electric resistance heater means;

temperature setting means having a plurality of temperature indicia thereon for indicating temperature selected, said temperature setting means being mounted for movement with respect to said mounting means and cooperatively connected to said means for establishing a temperature setting, said temperature setting means being configured in such manner that the movement thereof causes predetermined ones of said temperature indicia to be displayed and said means for establishing to establish a temperature setting corresponding to that displayed;

means for interconnecting said electric resistance heater means and said switch means;

a waterproof envelope surrounding said mounting means, said electronic thermostat means, said temperature setting means, said electric resistance heater means and said means for interconnecting;

said electric resistance heater means including an axially disposed former;

said waterproof envelope including a tube having open ends, and first and second bung means for sealing each end of said tube; and

first and second locator means, each of said first and second locator means including means for receiving and retaining said mounting means and annular spacer means for positioning said mounting means within said tube;

said first and second locator means each including centering post means, said centering post means on said first locator means being insertable within one of said sealing bung means to position said mounting means with respect thereto and said centering post means on said second locator means being fixed in position with respect to said axially disposed former to position said axially disposed former with respect to said mounting means.

4,983,814

FIBROUS HEATING ELEMENT

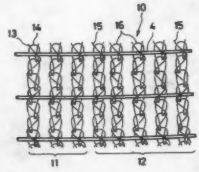
Katsunori Ohgushi, Tokyo; Masao Hijiri, Otsu, and Zenwemon Kitazawa, Gamou, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 59,448, Jun. 8, 1987, abandoned. This application May 9, 1989, Ser. No. 352,668

Claims priority, application Japan, Oct. 29, 1985, 60-240351

Int. Cl.[5] H05B *3/34, 3/54*

U.S. Cl. 219—545 **18 Claims**



1. A fabric heating element comprising fibrous heating elements and wire electrodes, wherein each of the fibrous heating elements comprises a core fiber coated with one or more electroconductive layers consisting of a polyurethane resin having carbon particles dispersed therein.

4,983,815

METHOD OF IDENTIFYING STAMPER FOR OPTICAL INFORMATION STORAGE DISK

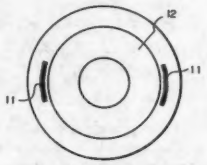
Osamu Kumasaka, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,459

Claims priority, application Japan, Feb. 17, 1989, 1-37744

Int. Cl.[5] G06F *15/46*

U.S. Cl. 235—376 **2 Claims**



1. A method of identifying a stamper for an optical information storage disk in order to distinguish first and second stampers from each other, the second stamper being replicated from the first stamper, each of the first and second stampers carrying recorded information signals and at least one printed code pattern recorded circumferentially and representing stamper identifying information from each other, said method comprising the steps of:

reading the printed code pattern in a predetermined direction;

determining whether a start or stop signal of the printed code is read first; and

distinguishing the first and the second stampers from each other depending on whether the start or stop signal is read first.

4,983,816

PORTABLE ELECTRONIC DEVICE

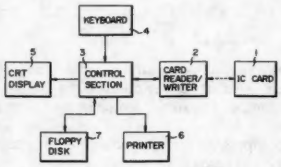
Yasuo Iijima, Baba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1989, Ser. No. 310,538

Claims priority, application Japan, Feb. 24, 1988, 63-39594; Feb. 26, 1988, 63-43465; Apr. 15, 1988, 63-93117

Int. Cl.[5] G06K *15/30*

U.S. Cl. 235—379 **13 Claims**



1. A portable electronic device, comprising:

first storage means, for storing a plurality of first data strings;

collation means for collating an externally entered second data string with one of said first data strings stored in said first storage means to determine whether a predetermined relationship exists therebetween;

second storage means for storing status information representing the predetermined relationship which is inherent in said one of said first data strings, when said comparing means determines the predetermined relationship being existed; and

means for causing said second storage means to store the same status information, corresponding to two of the first data strings, representing the existence of the predeter-

mined relationship of the collation so that at least two of said first data strings may have the same status information on the existence of the predetermined relationship.

4,983,817

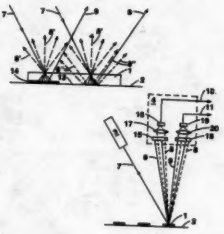
BACKGROUND COMPENSATING BAR CODE READERS

Thomas M. Dolash, Worthington; Paul G. Andus, Powell, and Mark E. O'Loughlin, Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 317,392, Mar. 1, 1989, abandoned. This application Aug. 10, 1989, Ser. No. 392,171

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—462 **27 Claims**



1. Apparatus for reading a luminescent bar code on a background surface whose reflectance may vary over the coded area, comprising

means for providing light to scan, and to excite luminescence in, the bar code,

means for providing light to scan, and to reflect without luminescence from the background surface of, the bar code,

means responsive to the reflected nonluminescent light for providing a first signal.

means responsive to the luminescence for providing a second signal, and

means responsive to the first and second signals for providing an output that is substantially independent of background reflectance in the coded area.

4,983,818

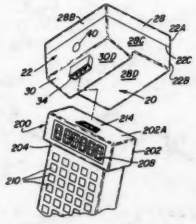
DATA ACQUISITION SYSTEM WITH LASER SCANNER MODULE

Carl H. Knowles, Moorestown, N.J., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.

Filed Jan. 30, 1989, Ser. No. 304,054

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—472 **18 Claims**



1. A data acquisition scanning system comprising a laser scanner module releasably secured to a portable data terminal, said data terminal comprising a first housing arranged to be held in one's hand, means for storing electrical input signals therein, and first connector means for connection to bar code reading means, said scanner module comprising a second housing which is very compact in size and includes a window, beam sweeping means located within said second housing for sweeping a laser beam from a predetermined point within said second housing through a predetermined angle to produce a scan pattern comprising at least one line, and beam folding means projecting the scan pattern out of said window, said beam folding means being located between said beam sweeping means and said window for folding the path of the swept beam within said second housing, said module additionally comprising second conductor means and signal processing means connected thereto for producing a first electrical signal indicative of the code scanned, said second connector means being arranged for releasable securement to said first connector means to mount said module on said data terminal and to carry said first electrical signal thereto.

4,983,819

OPTICAL CARD

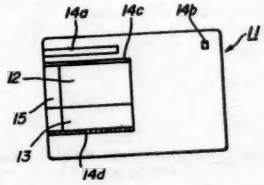
Akihiko Hashimoto, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 121,800

Claims priority, application Japan, Nov. 21, 1986, 61-276816

Int. Cl.[5] G06R *19/02*

U.S. Cl. 235—488 **5 Claims**



1. An optical card comprising:

a transparent substrate;

a read only memory portion comprising a first material layer formed on said substrate and having low reflectivity, and a second material layer formed on said first material layer and having high reflectivity, a plurality of through holes being formed in said first material layer to represent prerecorded binary data; and

a data read and write portion comprising a third material layer formed on said substrate and having low reflectivity, a plurality of through holes, which represent pits of all possible binary data to be recorded, being formed in said third material layer with a regular pitch, and a fourth material layer formed on said third material layer, said fourth material layer having a reflectivity which varies from high to low when a light beam for writing binary data is made incident thereupon through at least one of said through holes formed in said third material layer.

4,983,820

INTERFACE FOR RECEIVING ELECTRONIC TOKENS

Donald R. Dias, Carrollton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Division of Ser. No. 352,596, May 15, 1989, Pat. No. 4,948,954. This application Aug. 14, 1990, Ser. No. 567,881

Int. Cl.[5] G06K *19/06*

U.S. Cl. 235—492 **2 Claims**

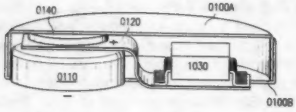
1. An interface for receiving two-terminal thin round electronic token data modules and establishing a data interface thereto, comprising:

a physical positioning device, dimensioned to receive electronic tokens in an orientation which is well-defined but which does not conclusively determine which face of the token is facing in which of two directions;

a grounded contact positioned to make contact to the edge of a token contacted by said physical positioning device;

first and second data contacts, positioned in said slot to make contact to the opposite faces of a token contacted by said physical positioning device;

first and second open-collector interface circuits, respectively connected to said first and second data contacts, said interface circuits each including a pull-up element;



circuitry connected to detect when one of said data contacts is pulled to ground, and thereby to detect that a token has been contacted by said physical positioning device and that the other of said data contacts is in contact with the data line of the token.

4,983,821

PHOTOMULTIPLIER TUBE WITH ELECTRODE SUPPORTS

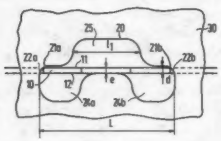
Hervé Chopy, Mansac, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 21, 1989, Ser. No. 369,566

Claims priority, application France, Jun. 24, 1988, 88 08501

Int. Cl.[5] H01J *40/14, 43/18*

U.S. Cl. 250—207 **5 Claims**



1. Photomultiplier tube comprising an electron multiplier assembly having supports provided with a plurality of slots and a plurality of electrodes attached to the supports by means of attachment lip which are each disposed inside a respective slot, wherein the improvement comprises: the attachment lip includes first and second surfaces, the slot includes outer supporting points at its extremities which contact said first surface of said attachment lip and at least one central supporting portion which is in contact with the second surface of said attachment lip, the portion of the slot disposed opposite the central supporting portion being recessed away from said attachment lip and the portions of the slot disposed opposite the outer supporting points being recessed away from said attachment lips to accommodate flexure of said attachment lip, and the outer portion of the slot proximate to the outer edges of the attachment lip are curved to further accommodate flexure of the attachment lip.

4,983,822

VARIABLE OPTICAL AXIS TYPE BOTTLE INSPECTING APPARATUS

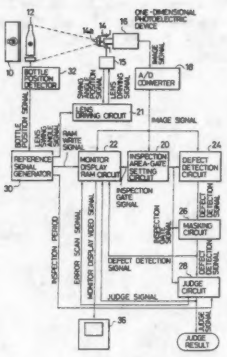
Hiroyuki Fukuchi, Yokohama, Japan, assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,287

Claims priority, application Japan, May 27, 1988, 63-128246

Int. Cl.[5] G01N *9/04, 21/00*

U.S. Cl. 250—223 B **12 Claims**



1. A variable optical axis type bottle inspecting apparatus comprising:

illuminating means for illuminating a bottle continuously conveyed in the direction of a conveying means and rotated about its axis by a rotating means;

an optical system for forming an image of lights transmitted through the bottle, the optical system having a lens for changing the optical axis of an optical system inserted in an optical path interconnecting a photoelectric converting means and the bottle being mounted independently of the rotating means for the bottle;

photoelectric converting means for photoelectrically converting the transmitted light images of the bottle;

optical axis changing means for moving the lens to change the optical axis of the optical system with respect to the photoelectric converting means in synchronization with the movement of the bottle so that the transmitted light images of the bottle continuously conveyed are detected continuously by the photoelectric converting means; and

inspecting means for inspecting the sidewall of the bottle for defects, based on the transmitted light images photoelectrically converted by the photoelectric converting means.

4,983,823

METHOD FOR DETERMINING INCIDENT ANGLE IN MEASUREMENT OF REFRACTIVE INDEX AND THICKNESS

Tami Isobe, Yokohama, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,203

Claims priority, application Japan, Jan. 20, 1989, 1-11037; Jan. 27, 1989, 1-18639

Int. Cl.[5] G02F *1/01*

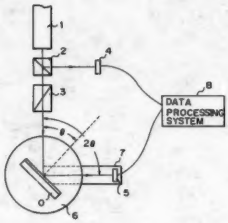
U.S. Cl. 250—225 **14 Claims**

1. A method for determining a measured incident angle of a monochromatic light for measurement of a refractive index and a thickness of a thin film of a single layer formed on a substrate having a known complex refractive index, said substrate being disposed in an incident medium having a known refractive index, said method comprising the steps of:

measuring a first reflectance of an S-polarized light or a

P-polarized light of a measured sample within said incident medium at various angles of incident of the monochromatic light having a known wavelength used in the measurement;

calculating a second reflectance of the S-polarized light or the P-polarized light when said monochromatic light is incident to said substrate within said incident medium, said second reflectance being calculated by using said complex



refractive index of said substrate and said refractive index of the incident medium as a function of the incident angle;

calculating a first angle satisfying an equation in which the first and second reflectance are equal to each other with respect to the S-polarized light or the P-polarized light; and

setting a second angle except for said first angle as the measured incident angle.

4,983,824

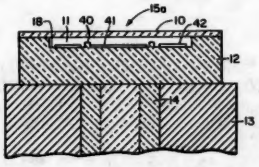
OPTICALLY RESONANT SENSOR WITH INCREASED MONOTONIC RANGE

Elric W. Saaski, Bothell, and Dale M. Lawrence, Lynnwood, both of Wash., assignors to MetriCor Inc., Woodinville, Wash.

Filed Jul. 6, 1989, Ser. No. 376,789

Int. Cl.[5] H01J 5/16; G01D 5/34

U.S. Cl. 250—227.27 **26 Claims**



1. A variable gap optical sensor device with a periodic response function comprising:

a pair of opposed reflective surfaces, at least a first one of said surfaces being integral with a flexible diaphragm so that the gap width between the reflective surfaces can be varied, the gap in the undeformed state being no greater than 30 μm;

an optical fiber mounted with respect to said opposed reflective surfaces so that light from the core of said fiber will be incident on at least a portion of said surfaces, and light reflected from said surfaces will be incident on said core; and

stiffening means comprising an optically transmissive raised stop means intermediate said opposed reflective surfaces, whereby the potential variation in said gap width is diminished, thereby increasing the monotonic range of said periodic response function.

4,983,825

DIFFRACTION TYPE OPTICAL ENCODER WITH IMPROVED DETECTION SIGNAL INSENSITIVITY TO OPTICAL GRATING GAP VARIATIONS

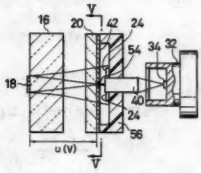
Souji Ichikawa, Sagamihara; Hideki Oka, Kawasaki; Naoyoshi Terao, Urawa, and Seiji Sakagami, Kawasaki, all of Japan, assignors to Mitutoyo Corporation, Tokyo, Japan

Division of Ser. No. 298,430, Jan. 18, 1989, Pat. No. 4,943,716. This application Mar. 8, 1990, Ser. No. 490,463

Claims priority, application Japan, Jan. 22, 1988, 63-12143; Feb. 25, 1988, 63-42626

Int. Cl.[5] G01D 5/34

U.S. Cl. 250—231.16 **4 Claims**



1. A reflective type optical encoder comprising:

a lighting system;

a main scale formed with a periodical first grating;

a light-transmitting index scale formed with corresponding periodical second gratings; and

a light-receiving element for photoelectrically transducing light emitted from said lighting system, reflected by the first grating and transmitted through the second gratings so as to produce a periodical detection signal in accordance with a relative displacement between said main scale and index scale;

said lighting system including a point light source and a condensing lens for focusing diffused rays from said point light course to form a secondary point light source;

positioned on a plane defined by the second gratings of the index scale.

4,983,826

ROTATION ANGLE DETECTING APPARATUS

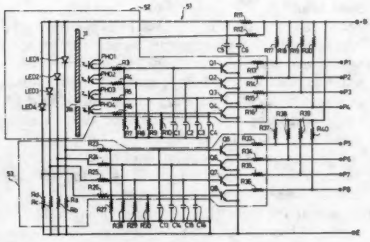
Kenji Hayase; Yutaka Iguchi, both of Toyoake, and Hidemori Tsuka, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Dec. 29, 1988, Ser. No. 291,823

Claims priority, application Japan, Dec. 29, 1987, 62-336077

Int. Cl.[5] G01D 5/34

U.S. Cl. 250—231.18 **8 Claims**



1. A rotation angle detecting apparatus comprising:

a rotary shaft;

a position-data generating circuit that outputs a position data

indicative of the rotational angle of the rotary shaft, the position-data generating circuit including first detecting circuits that are turned on or off according to the angle of rotation of the rotary shaft;

a state-generating circuit that outputs a state data indicative of the states of operation of said first detecting circuits, the state-generating circuit including a second detecting circuit that detects the states of operation of said first detecting circuits; and

a controlling circuit that transforms said position data and said state data to a serial data and outputs the serial data wherein said controlling circuit includes,

data transforming means that transforms said state data to a control data having a prescribed number of bits, and wherein n defines the number of state data bits, said prescribed number of bits of said control data being determined by rounding to the next higher integer the result of $\log_2(n+1)$, and

a parity circuit that performs a parity check on a data comprising said position data and said state data, and

wherein said serial data comprises said position data, said state data, and a parity bit.

4,983,827

LINESCAN APPARATUS FOR DETECTING SALIENT PATTERN OF A PRODUCT

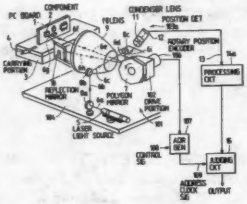
Kazutoshi Ikegaya, Sagamihara; Kunio Sannomiya, Atsugi; Yukifumi Tsuda, Kawasaki; Yuji Maruyama, Tokyo; Nobuhiro Araki, and Hiroto Toba, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 25, 1989, Ser. No. 427,507

Claims priority, application Japan, Oct. 25, 1988, 63-268437

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—235 **9 Claims**



1. A linescan apparatus for detecting salient pattern on a surface of a product comprising:

(a) a laser light source for continuously emitting a laser beam;

(b) a polygon mirror for reflecting said laser beam;

(c) drive means for rotating said polygon mirror to scan said laser beam;

(d) an $f\theta$ lens for focusing said laser beam from said polygon mirror onto a first plane perpendicular to a second plane in which said laser beam reflected at said polygon mirror is scanned, said $f\theta$ lens being arranged such that said polygon mirror located near a focus point of said $f\theta$ lens to cause said laser beam therefrom strikes against said first plane substantially perpendicularly;

(e) carrying means for moving said product along said first plane in the direction substantially perpendicular to said second plane;

(f) a mirror for reflecting said laser beam reflected at said surface of said product to direct said laser beam to said polygon mirror through said $f\theta$ lens, said mirror being positioned apart from said second plane; and

(g) detecting means for detecting unidimensional position variation of a beam spot made thereon by said laser beam from said mirror via said polygon mirror.

4,983,828

OPTO ELECTRONIC SCALE READING APPARATUS WHEREIN EACH OF A PLURALITY OF DETECTORS RECEIVES LIGHT FROM A CORRESPONDING EMITTER OF A PLURALITY OF LIGHT EMITTERS

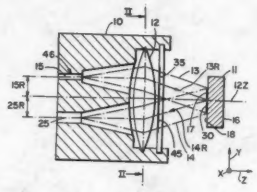
William F. N. Stephens, Glos, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom

Filed Aug. 21, 1989, Ser. No. 396,808

Claims priority, application United Kingdom, Jun. 21, 1986, 8615196

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—237 G **22 Claims**



1. An opto-electronic scale reading apparatus comprising

a scale defined by spaced lines;

a read head, said read head and said scale being relatively movable in the direction of spacing of said spaced lines;

a plurality of phase units located in said read head, each of said phase units comprising

a light emitter for illuminating a region of said scale;

a light receiver for receiving light from said illuminated region; and

grating means positioned in the light path between said emitters and said receivers for producing in respect of each of said phase units a light modulation corresponding to the relative movement of said scale and read head, said light modulations of said respective phase units occurring in a phase-shifted relationship, wherein

said phase units are positioned so that their respective light emitters illuminate a region of said scale whic is substantially common to all said emitters, and the receiver of each of said phase units receives only light from the emitter of the respective phase unit.

4,983,829

METHOD FOR ANALYZING GASES ACCORDING TO THE COUNTER FLOW PRINCIPLE

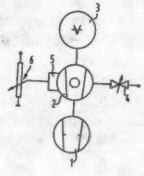
Heinz D. Bürger, Wertheim, Fed. Rep. of Germany, assignor to Alcatel Hochvakuumtechnik GmbH, Wertheim, Fed. Rep. of Germany

Filed Aug. 28, 1989, Ser. No. 400,171

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1988, 3831258

Int. Cl.[5] H01J *49/26*

U.S. Cl. 250—282 **5 Claims**



1. In a method for analysing gases according to the counterflow principle by sensing counterflow of gas to be analysed to a mass spectrometer via a mass spectrometer tube located at

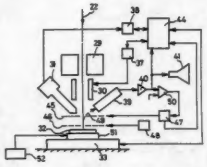
the suction side of a molecular pump coupled to a primary vacuum pump and an inlet for the gases to be analyzed connected to the outlet of the molecular pump, the improvement comprising the step of controlling the compression ratio of the molecular pump in order to prevent gases of a higher molecular weight from passing through the molecular pump in the counterflow direction to the mass spectrometer and measuring the fingerprint of the gas at said spectrometer, whereby a change in fingerprint signifies that a gas of higher molecular weight under consideration is present in the unknown gas being analyzed.

4,983,830

FOCUSED ION BEAM APPARATUS HAVING CHARGED PARTICLE ENERGY FILTER

Koji Iwasaki, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Jun. 29, 1989, Ser. No. 373,035
Int. Cl.[5] G01N *23/22*
U.S. Cl. 250—309 **12 Claims**



1. Ion beam apparatus for treating a specimen comprising:
sample stage means for mounting a specimen thereon and moving the sample in X, Y and Z directions;
ion beam irradiation means for irradiating a surface of the specimen with a focused ion beam;
detecting means for detecting secondary electrons emitted by the irradiated specimen;
energy filtering means having an extraction electrode for extracting the secondary electrons from the specimen surface, a grid electrode and a grid electrode power source for controlling the voltage of the grid electrode to selectively pass extracted electrons, the energy filtering means being disposed between the specimen and said detecting means for discriminating the secondary electrons emitted by the irradiated specimen according to their energy levels; and
input means for inputting a signal to the specimen.

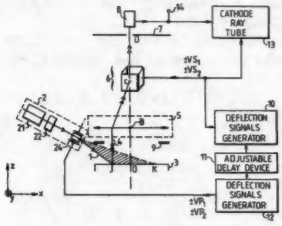
4,983,831

TIME-OF-FLIGHT ANALYSIS METHOD WITH CONTINUOUS SCANNING AND ANALYZER TO IMPLEMENT THIS METHOD

Henri-Noël Migeon, Jouy le Moutier, and Bernard Rasser, Paris, both of France, assignors to Cameca, Courbevoie, France

Filed Dec. 9, 1988, Ser. No. 282,325
Claims priority, application France, Dec. 11, 1987, 87 17288
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—309 **10 Claims**

1. A method for time-of-flight analysis comprising the steps of:
periodically scanning a surface of a solid sample to be analyzed by deflection of a beam of particles called primary particles, to liberate so-called secondary particles from the sample at the impact points of the beam of primary particles with the surface of the solid sample, to thereby generate points of emission of the secondary particles;
ionizing the secondary particles, some of which may be already ionized;
accelerating the secondary particles by an electrical field;
forming a beam of secondary particles, and making it travel through a path which is long enough for secondary particles with different energy levels or different masses to have substantially different times of flight;
then discriminating among the secondary particles on the basis of their time-of-flight differences, by bringing the secondary particles with a given time of flight into a predetermined direction, irrespectively of the place, on



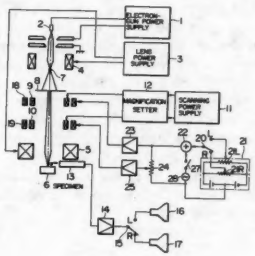
the sample, from which they have been liberated, in deflection the beam of secondary particles along an angle which may vary according to the point of emission of the secondary particles, and at periodic instants having a constant phase shift with respect to the deflection of the primary particles which liberated the secondary particles from the sample.

4,983,832

SCANNING ELECTRON MICROSCOPE

Mitsugu Sato, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,189
Claims priority, application Japan, Jul. 25, 1988, 63-183623
Int. Cl.[5] H01J *29/70*
U.S. Cl. 250—310 **14 Claims**



1. A scanning electron microscope comprising:
means for emitting an electron beam;
means for focusing said electron beam on a specimen, said focusing means including an objective lens;
first deflecting means for deflecting said electron beam so as to scan said specimen, said first deflecting means deflecting said electron beam so that a deflection fulcrum for said electron beam is substantially located on the principal plane of said objective lens;
second deflecting means for deflecting said electron beam so as to cause said electron beam to be incident on said specimen at a predetermined angle of incidence, said second deflecting means deflecting said electron beam so that the deflection fulcrum for said electron beam coincides substantially with the object point of said objective lens; and
means for detecting an information signal which is generated

from said specimen as a result of scanning said specimen with said electron beam.

4,983,833

DEVICE FOR THE DETECTING OF CHARGED SECONDARY PARTICLES

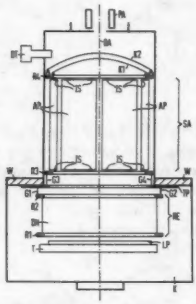
Matthias Brunner, Kirchheim; Ralf Schmid, and Michael Regula, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 14, 1989, Ser. No. 393,221

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1988, 3839316

Int. Cl.[5] G01N *23/00*; H01J *3/14*

U.S. Cl. 250—397 **13 Claims**



1. A charged secondary particle detection device for use in an apparatus having a primary beam focused on a specimen for generating said secondary particles, said detection device comprising:

means for detecting secondary particles;

means for deflecting said secondary particles onto said menas for detecting said means for deflecting having an axis of symmetry;

means for charging said means for deflecting with a deflecting potential and for superimposing a second potential on said deflection potential, said second potential acting to accelerated the secondary particles;

a tube electrode disposed below said means for deflecting in the direction of travel of said primary beam and having an axis of symmetry which is parallel with the axis of symmetry of said means for deflecting; and

means for applying a first potential to said tube electrode, said first potential being lower in amplitude than said second potential.

4,983,834

LARGE AREA PARTICLE DETECTOR SYSTEM

Joseph Lindmayer, Potomac, and Charles Y. Wrigley, Ijamsville, both of Md., assignors to Quantex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 85,465, Aug. 14, 1987, Pat. No. 4,812,660, and a continuation-in-part of Ser. No. 34,333, Mar. 3, 1987, Pat. No. 4,822,520. This application Jun. 7, 1988, Ser. No. 203,324

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[5] G01J *5/02*

U.S. Cl. 250—327.2 **22 Claims**

1. A particle detector for storing information for later retrieval corresponding to the impingement of radiation particles on its surface, comprising:

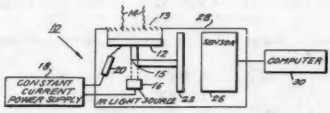
means for detecting and storing information corresponding to the impingement of a pattern of radiation particles, comprising an electron trapping material for releasably storing energy corresponding to the flux and pattern of said impingement radiation particles, said electron trapping material comprising:

a base material comprising an alkaline earth methal sulfide,

a first dopant of samarium, and

a second dopant of a cerium compound;

means for applying a first wavelength of light to said means



for detecting and storing information for causing said electron trapping material to release said stored energy in the form of light of a second wavelength corresponding to said flux and pattern of said impinging radiation particles; and

means for sensing released light of said second wavelength and for converting said released light to electrical signals representative of said flux and pattern of said impinging radiation particles.

4,983,835

METHOD FOR DETECTING PROSPECTIVE CONTOUR POINTS OF AN IRRADIATION FIELD

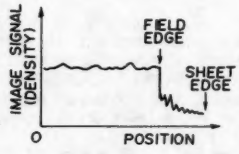
Hideya Takeo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 324,884

Claims priority, application Japan, Mar. 19, 1988, 63-66735; Mar. 19, 1988, 63-66736

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 **6 Claims**



4. A method for detecting a prospective contour point of an irradiation field, which comprises the steps of:

(i) detecting an image signal representing a radiation image from a recording medium which has been exposed to radiation over a limited irradiation field in order to record the radiation image thereon,

(ii) from said image signal, detecting digital image signal components at respective positions on said recording medium,

(iii) carrying out differentiation processing on the digital image signal components corresponding to positions located along a single line on said recording medium,

(iv) detecting the point nearest to an edge of said recording medium among the points, associated with differentiated

values obtained from the differentiation processing, which differentiated values have a predetermined positive or negative sign and the absolute values of which exceed a first threshold value, as a prospective contour point of the irradiation field,

(v) judging whether a point, associated with a differentiated value having a sign inverse to said predetermined sign and the absolute value of which exceeds a second threshold value, is or is not nearer to said edge of said recording medium along single said line than said point which has been detected as a prospective contour point of the irradiation field, and

(vi) in cases where the point, for which the corresponding differentiated value has a sign inverse to said predetermined sign and the absolute value of which differentiated value exceeds a second threshold value, is judged to be nearer to said edge, making a correction so that the point second nearest to said edge of said recording medium among the points for which the corresponding differentiated values obtained from the differentiation processing have said predetermined sign and the absolute values of which differentiated values exceed said first threshold value, is detected as a prospective contour point of the irradiation field.

4,983,836

METHOD FOR DETECTING THINNED OUT PORTION ON INNER SURFACE OR OUTER SURFACE OF PIPE

Yuji Matoba, and Toshio Koshihara, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 364,011

Claims priority, application Japan, Jun. 30, 1988, 63-163550; Jun. 30, 1988, 63-163551; Aug. 24, 1988, 63-210080

Int. Cl.[5] G01J *5/02*

U.S. Cl. 250—330 **10 Claims**

2. In a method for detecting a thinned out portion on the inner surface or the outer surface of a pipe which comprises the steps of:

heating or cooling a pipe to be tested from the side of the outer surface thereof or the inner surface thereof so that a difference in temperature is produced between (i) a portion of the outer surface or the inner surface of said pipe corresponding to a thinned out portion as a defective portion on the inner surface or the outer surface of said pipe; and (ii) a portion of the outer surface or the inner surface of said pipe corresponding to a normal portion of the inner surface or the outer surface of said pipe; then

shooting the outer surface or the inner surface of said pipe by means of a thermal imaging system while said difference in temperature still remains on the outer surface or the inner surface of said pipe, to obtain a thermal image of said difference in temperature; and then

detecting said thinned out portion on the inner surface or the outer surface of said pipe by means of the thus obtained thermal image;

the improvement comprising:

determining a temperature distribution of said thermal image of said difference in temperature on a line passing the highest temperature point or the lowest temperature point in said thermal image of said difference in temperature; then

calculating a differential value of said temperature distribution; then

determining two points of inflection on both sides of said highest temperature point or said lowest temperature point of said temperature distribution for said thinned out portion on the basis of said calculated differential value of said temperature distribution; and then

detecting an extent of said thinned out portion on the basis of a distance between said two points of inflection of said temperature distribution;

heating or cooling an experimental pipe having an artificial thinned out portion of a prescribed extent and a prescribed depth on the inner surface or the outer surface of said experimental pipe, from the side of the outer surface thereof or the inner surface thereof, to previously determine a heat analysis data concerning the relationship between (i) the highest temperature or the lowest temperature of a portion of the outer surface the inner surface of said experimental pipe corresponding to said artificial thinned out portion of the inner surface or the outer surface of said experimental pipe, (ii) the extent of said artificial thinned out portion, and (iii) the depth of said artificial thinned out portion; and then

detecting a depth of said thinned out portion of said pipe to be tested on the basis of (i) said extent of said thinned out portion detected by said distance between said two points of inflection of said temperature distribution, (ii) said highest temperature point or said lowest temperature point in said thermal image of said difference in temperature, and (iii) said previously determined heat analysis data.

4,983,837

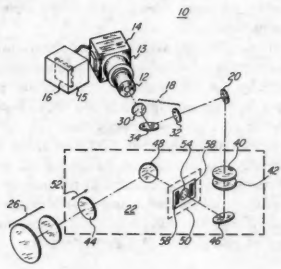
FORWARD LOOKING INFRARED IMAGING SYSTEM

Erwin E. Cooper, Carrollton; Franklin L. Davis, Dallas, and Stephen F. Sagan, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1988, Ser. No. 265,365

Int. Cl.[5] H01J *31/49*; G02B *13/14*; H01L *31/04*

U.S. Cl. 250—334 **39 Claims**



1. A method for modifying an existing forward looking infrared imaging system wherein the system is of the type which processes radiation received from a scene to form an image thereof, wherein the system includes a first Galilean afocal lens combination and wherein sensor components include a detector element array of the type which subtends the field of view along a first direction and a scanning device for varying the field of view along a second direction in order to provide a two dimensional image, the method comprising the steps of:

forming a first reimaging afocal lens system comprising at least first and second lenses and a plane for forming an image therebetween;

positioning a thermal reference source in the reimaging system; and

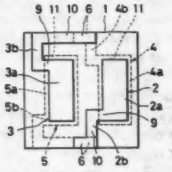
positioning the reimaging system along the optical path of the existing first system between the Galilean lens combination and the scanning device.

4,983,838

PYROELECTRIC ELEMENT

Aisaku Nagai, Iwaki, and Norikazu Murata, Tokyo, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,419
Claims priority, application Japan, Apr. 13, 1988, 63-49681[U]
Int. Cl.[5] G01J 5/14
U.S. Cl. 250—338.3 12 Claims



1. A pyroelectric element comprising:

a pyroelectric film;

first and second electrodes formed on one major surface of said pyroelectric film; and

third and fourth electrodes formed on the other major surface of said pyroelectric film;

each of said first to fourth electrodes being provided with an electrode body for defining an effective light-receiving area and a lead portion extending from said electrode body,

said first and third electrodes and a portion of said pyroelectric film which is sandwiched between said first and third electrodes constituting a first unit pyroelectric element, and said second and fourth electrodes and a portion of said pyroelectric film which is sandwiched between said second and fourth electrodes constituting a second unit pyroelectric element,

wherein directions and widths of proximal end portions of said lead portions extending from said electrode bodies are substantially the same relative to each other such that the effective light-receiving electrode area of said first unit pyroelectric element which is constituted by an overlapping portion between said first and third electrodes is substantially the same as that of the second unit pyroelectric element which is constituted by an overlapping portion between said second and fourth electrodes even if patterns of said first and second electrodes are offset from patterns of said third and fourth electrodes.

4,983,839

PYROELECTRIC MATERIALS

Krishna K. Deb, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1989, Ser. No. 395,700
Int. Cl.[5] C04B 35/46; H01J 31/49
U.S. Cl. 250—338.3 16 Claims

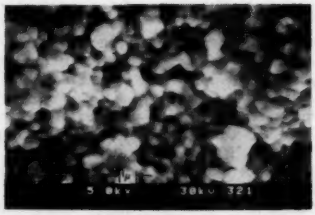
1. An improved pyroelectric material comprising:

modified lead titanate having an average grain size between 1 and 2 microns and wherein at least twenty percent of the lead has been replaced by calcium to lower the temperature at which the pyroelectric coefficient peaks occur and thus provide an improved Figure of Merit.

5. An electromagnetic radiation sensor comprising:

a thin plate of lead-calcium-titanate having an average grain size between 1 and 2 microns, a thickness of approximately 25 microns and an atomic ratio of lead to calcium no greater than 4;

said plate being electrically polarizable normal to its broad surfaces; and



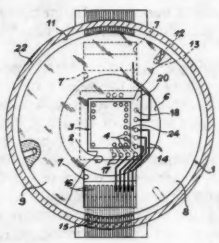
a separate electrode of highly conductive material intimately contacting each of the two opposed broad surfaces of said plate to form an anode and a cathode.

4,983,840

MEASURING SYSTEM CONSTITUTED BY A RADIATION DETECTION CIRCUIT, A READING CIRCUIT AND A SUPPORT SUCH AS A CRYOSTAT COLD FINGER

Jean-Louis Ouvrier-Buffet, Sevrier, and Michel Ravetto, Seyssinet Pariset, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 19, 1990, Ser. No. 513,101
Claims priority, application France, Apr. 28, 1989, 8905711
Int. Cl.[5] G01J 5/02, 5/04
U.S. Cl. 250—352 4 Claims

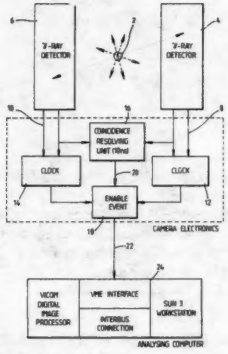


1. Measuring system constituted by a radiation detection circuit (3), a reading circuit (2) welded to the detection circuit (3) by metal members (4), some of which constitute electrical connections, and a support such as a cryostat cold finger (1), characterized in that said measuring system also comprises a cover (9) fixed to the support (1) and defining therewith a cavity (6, 10), the latter containing the circuits (2, 3), the cover (9) being provided with electrical conductive tracks (14), the reading circuit (2) being welded to the cover (9) by other metal members (19), at least some of these constituting the electrical connections and touching the conductive tracks (14), the cover having a transparent window (10) in front of which is positioned the detection circuit (3).

4,983,841
NON-INVASIVE INSPECTION

Peter A. E. Stewart; Richard T. Skelton; Martin J. Allen, all of Bristol, and Joseph Douglas, Derby, all of England, assignors to Rolls-Royce plc, London, England

Filed Sep. 26, 1989, Ser. No. 412,337
Claims priority, application United Kingdom, Oct. 4, 1988, 8823276.4
Int. Cl.[5] G01T *1/169*
U.S. Cl. 250—358.1 **21 Claims**



1. A method of non-invasively inspecting a hollow article for trapped foreign matter comprising:

filling the interior of the hollow article with a mixture comprising a carrier fluid and a radioisotope capable of being absorbed by said trapped foreign matter;

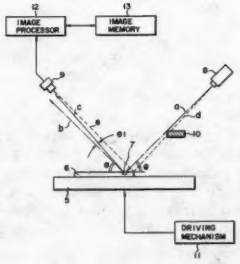
draining the mixture comprising unabsorbed radioisotope from the interior of the article; and

using radiation sensitive detecting means to track emissions from the radioisotope absorbed by any trapped foreign matter within the hollow article.

4,983,842
IMAGE READING APPARATUS

Jun Takamine, Shinmachi, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,352
Claims priority, application Japan, Mar. 31, 1988, 63-79062
Int. Cl.[5] G01N *21/00, 21/01, 21/47*
U.S. Cl. 250—358.1 **6 Claims**



1. A combination of a member to be measured having on one major surface a region to be measured having a pattern formed by etching a plurality of recessed characters aligned at least in an array; and an image reading apparatus,

said image reading apparatus comprising:

radiation means for simultaneously radiating, onto the pattern, an incoherent parallel light beam having a radiation spot of dimensions corresponding to those of the region to be measured;

measurement means, having a light-receiving surface which is shifted from an optical axis of a regular reflection beam so as to receive a reflection beam off-set from the regular reflection beam by the region to be measured, for measuring the pattern on said member of the received beam; and

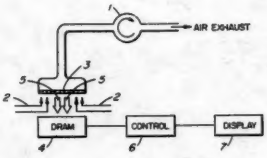
block means, arranged between said radiation means and the member to be measured, for preventing a peripheral beam of the parallel light beam from being incident on the region to be measured;

wherein said light-receiving surface of said measurement means has an angle of 2° to 5° with respect to the optical axis of the regular reflection beam from the pattern.

4,983,843
RADON DETECTOR

Ian Thomson, 9 Nesbitt St., Nepean, Ontario, Canada (K2H 8C4)

Filed Apr. 24, 1989, Ser. No. 342,336
Claims priority, application Canada, May 27, 1988, 567998
Int. Cl.[5] G01T *1/02*; H01L *31/115*
U.S. Cl. 250—370.02 **21 Claims**

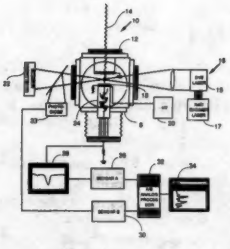


1. For use in an ionizing radiation particle detector, a dynamic random access memory (DRAM) devoid of an ionizing radiation absorbing layer for exposure to said particles, means for relaxing all actual cells of the DRAM which are to be used to detect said particles, and means for reading the cells of the DRAM after exposure thereof to said particles to determine an indication of the degree of ionizing radiation particles impinged on the DRAM.

4,983,844
FAST ATOMIC LINE FILTER

Eric J. Korevaar, San Diego, Calif., assignor to Thermo Electron Technologies Corp., San Diego, Calif.

Filed Oct. 17, 1989, Ser. No. 422,671
Int. Cl.[5] G01J *5/00, 5/08*; G02B *5/20, 5/22*
U.S. Cl. 250—382 **11 Claims**



1. A fast atomic line filter system for detecting a narrowband signal light defining a nominal wavelength comprising:

a first sealed chamber having an aperture for the passage of signal light into the interior of said container

a gas contained in said sealed chamber, the atoms of said gas having a specific energy level corresponding to the nominal wavelength of said signal light and a Rydberg level,

a pump means for exciting the atoms of said gas from said specific energy level to said Rydberg level.

a high voltage means for creating an electrical potential across all or a portion of said gas said electrical potential being high enough to ionize essentially all atoms of said gas excited to said Rydberg level and

a detection means for detecting ionization events.

4,983,845

APPARATUS OPERATING WITH CONTACT IONIZATION FOR THE PRODUCTION OF A BEAM OF ACCELERATED IONS

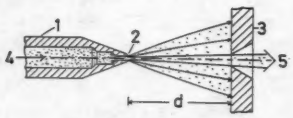
Helmuth Liebl, Eching, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften v.V., Fed. Rep. of Germany

Continuation of Ser. No. 265,056, Oct. 31, 1988, abandoned. This application May 2, 1990, Ser. No. 519,268

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739253

Int. Cl.[5] H01J *27/00*

U.S. Cl. 250—423 R **19 Claims**



1. An apparatus operating by contact ionization for the production of a beam of accelerated ions comprising a source of atoms for ionization, an ionization electrode having a tubular contact ionization surface for contact ionization of the atoms, a heating device for heating the ionization electrode and an acceleration electrode spaced from the ionization electrode to accelerate the atoms ionized on the contact ionization surface, the ionization electrode forming a tubular duct which leads from the source of atoms for ionization to an exit at a tip projecting toward the acceleration electrode which produces a predetermined field strength at said tip, said tip having a given diameter, and the inner wall of said tubular duct forming said tubular contact ionization surface, said tip being spaced by a predetermined distance from said acceleration electrode, and said tip diameter being substantially smaller than said predetermined distance from said acceleration electrode to result in an emission current density substantially independent of space charge effects.

4,983,846

PORTABLE FINGERPRINT DETECTION METHOD AND DEVICE

Arturo M. Rios, St. Petersburg, and Michael Palermiti, Palm Bay, both of Fla., assignors to Arturo M. Rios, Arecibo, P.R.

Filed Aug. 22, 1989, Ser. No. 397,132

Int. Cl.[5] G01J *1/58, 1/00*

U.S. Cl. 250—458.1 **27 Claims**

1. A portable device for detecting fingerprints without a laser by illuminating a fingerprint which has been made fluorescent, and receiving the wavelength-shifted reflections from the fluorescent fingerprint, comprising:

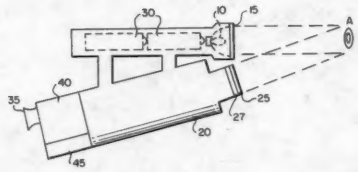
(a) a noncoherent light source for illuminating a fingerprint;

(b) a first filter for filtering light from said light source, said first filter having a first predetermined center wavelength between 500 and 600 nanometers;

(c) a light intensifier for receiving reflections from the illuminated fingerprint and for intensifying the reflections at least several thousand times;

(d) a second filter for filtering light received at said light intensifier, said second filter having a second predetermined center wavelength,

said second center wavelength being separated from said



first center wavelength by approximately the wavelength shift caused by reflection from the fluorescent fingerprint, and

said first and second filters each having a one-half bandpass much less than said wavelength shift; and

(e) means for viewing the intensified reflections so that fingerprints may be detected.

4,983,847

X-RAY INTENSIFYING SCREEN INCLUDING A TITANIUM ACTIVATED HAFNIUM DIOXIDE PHOSPHOR CONTAINING INDIUM

Philip S. Bryan, Webster; Patrick M. Lambert; Christine M. Towers, both of Rochester, and Gregory S. Jarrold, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 16, 1989, Ser. No. 437,866

Int. Cl.[5] C09K *11/67*

U.S. Cl. 250—483.1 **12 Claims**

1. A screen comprised of

a support and

a fluorescent layer containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide phosphor host, characterized in that the monoclinic crystals consist essentially of oxygen and combined elements satisfying the relationship

$$Hf_{1-z}Zr_zTi_xM_yIn_w$$

wherein

M represents at least one alkali metal;

w is in the range of from 1×10^{-6} to 5×10^{-3};

x is in the range of from 3×10^{-4} to 1.0;

y is up to 1; and

z is up to 0.3,

the phosphor exhibiting reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent indium.

2. A screen comprised of

a support and

a fluorescent layer containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide phosphor host,

characterized in that the monoclinic crystals consist essentially of oxygen and combined elements satisfying the relationship

$$Hf_{1-z}Zr_zTi_xM_yIn_wNd_v$$

wherein

M represents at least one alkali metal;

v is in the range of 5×10^{-8} to 5×10^{-4};

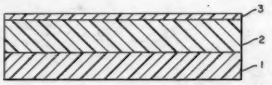
w is in the range of from 1×10^{-6} to 5×10^{-3};
x is in the range of from 3×10^{-4} to 1.0;
y is up to 1; and
z is up to 0.3, when excited by X-radiation the phosphor exhibiting reduced afterglow as compared to the phosphor defined above absent neodymium.

4,983,848

SURFACES FOR X-RAY INTENSIFYING SCREENS

Susan J. Hunter, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1989, Ser. No. 337,157
Int. Cl.[5] G21K 4/00
U.S. Cl. 250—483.1 10 Claims



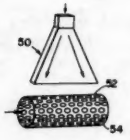
1. An X-ray intensifying screen comprising a support having thereon a phosphor-binder layer, and a polymeric film adhered to the phosphor-binder layer, the improvement wherein bonded to the phosphor-binder layer is a clear, transparent, flexible, tough, dimensionally stable polyamide film having a thickness of no greater than about 15.2 μm, the X-ray intensifying screen having an average dynamic coefficient of friction in the range of 0.15 to 0.25, and low static susceptibility when the screen is used within a book cassette or an automatic changer therefor, and the surface of the screen has a static decay ½ time less than 6.0 seconds at 60% R.H.

4,983,849

APPARATUS AND METHOD FOR PROMOTING UNIFORM DOSAGE OF IONIZING RADIATION IN TARGETS

Chester C. Thompson, Rosyln Heights; Marshall R. Cleland, Hauppauge, and Edward J. Lopez, Stony Brook, all of N.Y., assignors to Radiation Dynamics, Inc., Edgewood, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,323
Int. Cl.[5] H01J 37/04
U.S. Cl. 250—492.3 18 Claims



1. Apparatus for promoting radiation dose uniformity in exposed targets, comprising:
a source of ionizing radiation, said source including means for generating a beam of ionizing radiation a scan zone and a beam exit window;
target support means for supporting the targets, said target support means being located at a selected distance from said window;
a rotatable mass means for absorbing energy of said radiation and inducing increased radiation scattering, said mass means being located between said window and said target support means; and
cooling means for cooling said mass means.

4,983,850

ION IMPLANTATION DEVICE

Osamu Tsukakoshi, Hiratsuka; Yuzo Sakurada, Fujisawa, and Kazuhiro Kashimoto, Hatano, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Mar. 9, 1989, Ser. No. 321,221
Claims priority, application Japan, Mar. 11, 1988, 63-56415; Mar. 31, 1988, 63-75830
Int. Cl.[5] H01J 37/20
U.S. Cl. 250—492.3 8 Claims

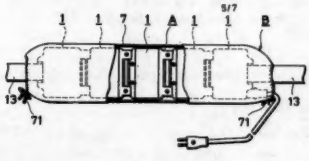
1. An ion implanter system comprising a deflector system including a first multiple pole electrostatic deflector having five or more poles for deflecting ion beams, and a second multiple pole electrostatic deflector having poles of the same number as that of said first multiple pole electrostatic deflector and disposed coaxially at the rear of said first multiple pole electrostatic deflector for deflecting and pointing the ion beams deflected by said first multiple pole electrostatic deflector to a definitely predetermined direction, each of the corresponding electrodes of said first and second multiple pole electrostatic deflectors being disposed in the same plane including the optical axis and on the opposite side of the axis to each other; and means for controlling said first and second multiple pole electrostatic deflectors so as to scan a region defined by an equilateral polygon whose sides are in number equal to or twice the poles of said each electrostatic deflector, a target being constantly scanned by means of the parallel ion beams pointed parallel to the definitely predetermined direction.

4,983,851

CONTACT THERAPEUTICAL APPARATUS

Isamu Masuda, and Mitsuharu Hayashi, both of Fukuoka, Japan, assignors to Nihonkenkozoshinkenkyukai Co., Ltd., Fukuoka, Japan

PCT No. PCT/JP88/00367, § 371 Date Nov. 17, 1988, § 102(e) Date Nov. 17, 1988, PCT Pub. No. WO89/06991, PCT Pub. Date Aug. 10, 1989
PCT Filed Apr. 13, 1988, Ser. No. 314,354
Claims priority, application Japan, Jan. 30, 1988, 63-11742; Feb. 23, 1988, 63-23634
Int. Cl.[5] G21G 4/00
U.S. Cl. 250—493.1 43 Claims



1. A therapeutic apparatus to be disposed next to a person's body for effecting radiation of said person's body comprising: a casing means, heat-generating means within said casing means operable to generate heat, and far infrared radiating means disposed on said casing means, said far infrared radiating means being excited by the heat generated by said heat-generating means.

4,983,852

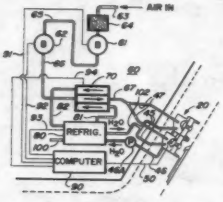
SYSTEM AND METHOD FOR PHOTOCHEMICALLY CURING A COATING ON A SUBSTRATE

Joseph T. Burgio, Jr., 705 Jennings St., Bethlehem, Pa. 18017

Continuation-in-part of Ser. No. 272,763, Nov. 17, 1988. This application Nov. 7, 1989, Ser. No. 431,122

Int. Cl.[5] G01K *13/02*

U.S. Cl. 250—504 R **16 Claims**



1. Apparatus for curing a coating on a moving substrate by ultraviolet radiation comprising:

(A) a lamp-reflector assembly comprising:

(a) an elongated reflector block having:

(i) a cavity having a reflective surface, and

(ii) a conduit extending through said block,

(b) an elongated ultraviolet lamp having a central portion within said reflector block cavity;

(B) refrigerating means for cooling a liquid;

(C) a closed loop system for circulating said cool liquid between said reflector block conduit and said refrigerating means comprising:

(a) pump means, and

(b) tubing means;

(D) a control system comprising:

(a) temperature monitoring means for monitoring the temperature of said cooling liquid circulated through said closed loop system, and

(b) control means connected with said temperature monitoring means and said refrigerating means for receiving signals from said temperature monitoring means and signaling said refrigerating means when the signals from said temperature monitoring means indicate that the cooled liquid circulating through said closed loop system has deviated from an established temperature range.

4,983,853

METHOD AND APPARATUS FOR DETECTING FLAME

Peter W. N. Davall, White City, and John D. Spencer, Halifax, both of Canada, assignors to Saskatchewan Power Corporation, Regina, Canada, by said Peter W. N. Davall

Filed May 5, 1989, Ser. No. 348,685

Int. Cl.[5] G08D *17/12*

U.S. Cl. 250—554 **50 Claims**

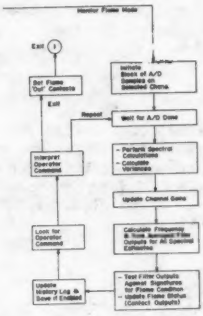
1. A method of detecting flame within a region, comprising the steps of:

(a) measuring radiation emitted from said region within a selected portion of a visible frequency band;

(b) concurrently measuring radiation emitted from said region within a selected portion of an infra-red frequency band;

(c) deriving the coherency between said measurements;

(d) comparing said coherency with a prestored coherency signature representative of the coherency between measurements of radiation emitted from said region within said selected portions of said visible and infra-red frequency bands while known flame conditions prevail within said region, thereby estimating the deviation of said derived coherency from said prestored coherency signature; and,



(e) comparing said deviation with a first predetermined threshold alarm value.

4,983,854

SHEET DETECTION APPARATUS WITH REFLECTING MEMBER

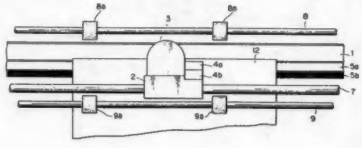
Toshiaki Mizuno, Nagoya; Shinji Kimura, Kani; Toshiaki Sugiura, Hekinan; Mikio Sakuma, Ichinomiya; Tasuku Sugimoto, Seto, and Mamoru Imaizumi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 8, 1989, Ser. No. 404,862

Claims priority, application Japan, Sep. 15, 1988, 63-231189; Sep. 15, 1988, 63-231190

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **20 Claims**



9. A sheet detection apparatus comprising:

at least two light radiation means for outputting a predetermined amount of light;

at least two sensor means provided at positions on one side of a sheet feed path for receiving the light from said radiation means by way of a sheet on said path;

a reflection member provided on the side of said sheet feed path opposite to said two sensor means, said reflection member reflects the light from said two sensor means; and

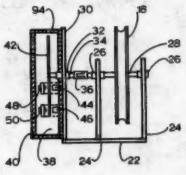
detection means for detecting whether one of various types of sheets is present on said sheet feed path as well as the type thereof by comparing output values from said two sensor means with predetermined reference values.

4,983,855

LIQUID LEVEL GAUGE FOR TANKS

John F. Grimes, Box 217, Lampman, Saskatchewan, Canada (S0C 1N0)

Filed Feb. 14, 1989, Ser. No. 309,864
Claims priority, application United Kingdom, Feb. 19, 1988, 8803875; Jun. 10, 1988, 8813808
Int. Cl.[5] G06K 7/15
U.S. Cl. 250—577 13 Claims



1. A liquid level gauge for tanks comprising:

cable means having one end in said tank and an opposite end outside the tank;

rotor means outside the tank about which the cable means is engaged;

mounting means mounting the rotor means for free rotation;

a float located in the tank to follow the level of liquid therein, the float being secured to the one end of the cable means;

balance means connected to the opposite end of the cable means for applying a tension on the cable means;

signal generating means comprising a disc connected to the rotor means for rotation therewith and switch means comprising two switches operatively associated with the disc for generating respective first and second signals, which comprise respective sets of signal pulses, in response to rotation of the disc, the first and second signals representing the magnitude of vertical movements of the float and the direction of such movements; and

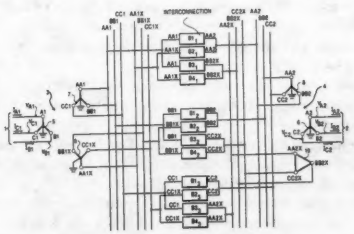
counter means having two inputs operatively connected to the signal generating means for receiving the first and second signals from the signal generating means and for maintaining a running count representing the liquid level in the tank.

4,983,856

METHOD AND SYSTEM FOR INTERCONNECTING IN QUADRATURE TWO SYNCHRONOUS OR ASYNCHRONOUS THREE-PHASE NETWORKS

Pierre Pelletier, Boucherville, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Aug. 3, 1989, Ser. No. 389,230
Claims priority, application Canada, Aug. 4, 1988, 573807
Int. Cl.[5] H02J 3/34
U.S. Cl. 307—20 47 Claims



1. A system for interconnecting a first and a second three-phase alternating electric networks operating synchronously or asynchronously at respective three-phase alternating voltages of equal or adjacent frequencies, comprising:

first transformer means having (a) primary windings supplied with the three-phase voltage of the first network, and (b) secondary windings for producing from the three-phase voltage of the first network a first and a second secondary three-phase voltages, each phase of the first secondary voltage being out of phase with respect to one of the phases of the second three-phase voltage by a first angle;

second transformer means having (a) primary windings supplied with the three-phase voltage of the second network, and (b) secondary windings for producing from the three-phase voltage of the second network a third and a fourth secondary, three-phase voltages, each phase of the third secondary voltage being out of phase with respect to one of the phases of said fourth voltage by a second angle different from said first angle;

a plurality of variable reactive impedances for establishing between each phase of said first and second voltages and two phases of said third and fourth voltages out of phase by said second angle, two single-phase interconnections of variable susceptances, respectively; and

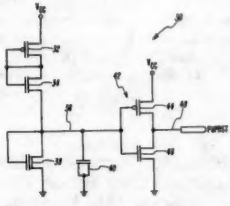
regulating means for measuring electric parameters related to the operation of the first and second networks, and for operating the variable reactive impedances in relation to the so measured parameters in order to vary the susceptances of the said interconnections so as to establish through said interconnections and said first and second transformer means a desired transfer of electric active power from one of the first and second networks to the other network while maintaining at a desired level an electric reactive power engaged in said transfer of active power.

4,983,857

POWER-UP RESET CIRCUIT

Randy C. Steele, Southlake, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jul. 31, 1989, Ser. No. 387,848
Int. Cl.[5] H03K 5/153, 17/20, 17/22, 17/687
U.S. Cl. 307—272.3 6 Claims



1. A circuit for generating a power-up reset signal on an integrated circuit chip, comprising:

an inverter having an input and an output;

a capacitor connected between a power supply ground and the inverter input;

a load connected to a power supply voltage and to the inverter input for conducting current only when the power supply voltage rises above a preselected value, whereby said capacitor is charged only when the power supply voltage is greater than the preselected value; and

means including a transistor connected to the inverter input for holding a voltage across said capacitor to power supply ground until said load begins to conduct;

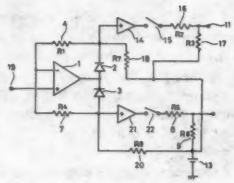
wherein the power-up reset signal is generated by the inverter output.

4,983,858

LEVEL DETERMINING CIRCUIT GENERATING OUTPUT SIGNAL AT FIRST OR SECOND OUTPUT TERMINAL ACCORDING TO LEVEL OF INPUT SIGNAL

Tsutomu Ishikawa, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 7, 1989, Ser. No. 404,012
Claims priority, application Japan, Sep. 8, 1988, 63-118001[U]
Int. Cl.[5] H03K 5/153; G06G 7/12
U.S. Cl. 307—362 5 Claims



1. A level determining circuit comprising:
a reference voltage source (13),
comparing means (1) for outputting a signal of one polarity in accordance with the relation of magnitude between two inputs,
means (19) for supplying an input signal to one input of said comparing means therethrough,
first and second rectifying means (2, 3) connected to the output of said comparing means to have the opposite polarities to each other,
first and second feedback resistance means (4, 7) each for feeding back the output of said comparing means which has been rectified by said first or second rectifying means to the other input of said comparing means,
means (8, 9, 18) for applying a reference voltage from said reference voltage source to each of the first node between said first rectifying means and said first feedback resistance means and the second node between said second rectifying means and said second feedback resistance means,
first output terminal (11) for supplying a signal obtained at said first node therethrough,
second output terminal (12) for supplying a signal obtained at said second node therethrough,
buffer amplifier means (14) interposed in at least either one of the first signal path between said first node and said first output terminal and the second signal path between said second node and said second output terminal, and
switch means (15) for disconnecting the output of said buffer amplifier means.

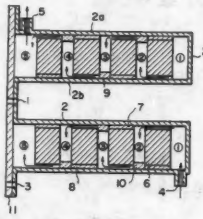
4,983,859

MAGNETIC DEVICE FOR HIGH-VOLTAGE PULSE GENERATING APPARATUSES

Shin Nakajima, Kumagaya; Akira Yamataka, Saitama; Hideaki Shimizu, Kumagaya; Kiyotaka Yamauchi, Kumagaya, and Shunsuke Arakawa, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,709
Claims priority, application Japan, Aug. 25, 1988, 63-211353
Int. Cl.[5] H01F 27/08
U.S. Cl. 307—419 11 Claims

1. A magnetic device for high-voltage pulse generating apparatuses comprising:
(a) at least one cylindrical conductor for defining a cavity, said cylindrical conductor being provided with input and output terminals and an inlet and an outlet for a coolant;
(b) at least one sealing member fixed to said cylindrical conductor;
(c) a plurality of wound magnetic cores each composed of a magnetic ribbon laminated with an insulating layer, said wound magnetic cores being fixed to said cylindrical conductor with such an interval as to provide a certain space between the adjacent wound magnetic cores; and
(d) an outer ring member disposed between each of said magnetic cores and said cylindrical conductor and having



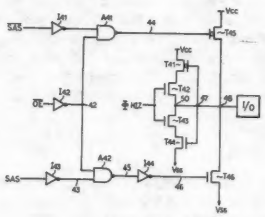
at least one path for permitting said coolant to flow therethrough, whereby said coolant flows in a radial or circumferential direction of each wound magnetic core in each space between the adjacent wound magnetic cores.

4,983,860

DATA OUTPUT BUFFER FOR USE IN SEMICONDUCTOR DEVICE

Hyung-Kyu Yim, Seoul; Jung-Dal Choi, Kyungsan-gun, and Woong-Moo Lee, Seoul, all of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon Kyung Ki-Do, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,342
Claims priority, application Rep. of Korea, Apr. 12, 1988, 1988-4120[U]
Int. Cl.[5] H03K 17/16, 19/96
U.S. Cl. 307—443 20 Claims



1. A data output buffer circuit for use in a semiconductor device, for buffering data received from a sense amplifier output, said circuit comprising:
inverting means for providing inverted signals by inverting the data received from the sense amplifier output;
logic means for receiving the inverted signals of said inverting means and an inverted signal of an output enable signal, and therefrom generating output driving control signals;
output driving means for supplying an output potential to an output node according to said output driving control signals; and
precharging driver means controlled by address transition detection signals, for precharging an output data bus, said precharging driver means including:
first and second transistors receiving at each gate thereof the address transition detection signals, a source of said first transistor and a drain of said second transistor being coupled to said output node,
a third transistor having drain and source respectively

coupled to a drain of said first transistor and a first source supplying voltage, and

a fourth transistor having drain and source respectively coupled to a source of said second transistor and a second source supplying voltage,

whereby the output potential from said output driving means is fed back to each gate of said third and fourth transistors, through said output node.

4,983,861

SEMICONDUCTOR INTEGRATED CIRCUIT WITH AN INPUT BUFFER CIRCUIT FOR PREVENTING FALSE OPERATION CAUSED BY POWER NOISE

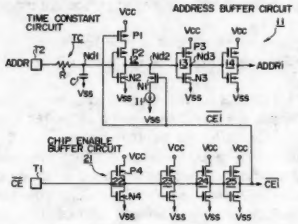
Shinichi Kikuchi; Hiroshi Iwahashi, both of Yokohama; Hideo Kato, Kawasaki, and Isao Sato, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

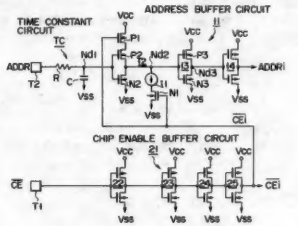
Filed Sep. 25, 1989, Ser. No. 412,120

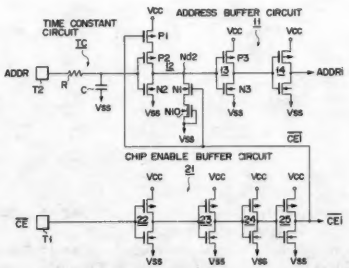
Claims priority, application Japan, Sep. 26, 1988, 63-240023

Int. Cl.[5] H03K *19/003, 19/094, 17/16, 17/284*

U.S. Cl. 307—443 **26 Claims**







1. A semiconductor integrated circuit comprising:

a first input circuit for generating an internal chip enable signal for controlling said semiconductor integrated circuit to be in an active state or a stand-by state, in response to a chip enable signal externally applied; and

a second input circuit for applying a signal to an internal circuit, said signal is corresponding to a data signal externally applied, said second input circuit including a gate circuit responsive to said internal chip enable signal and said data signal,

said gate circuit responding to said data signal at a first response speed, and responding to said internal chip enable signal at a second response speed when said semiconductor integrated circuit is changed from said active state to said stand-by state, said second response speed being slower than said first response speed so as to prevent said semiconductor integrated circuit from being set into the stand-by state by a false operation of said first input circuit.

4,983,862

SEMICONDUCTOR INTEGRATED CIRCUIT WITH A BI-MOS INPUT CIRCUIT FOR PROVIDING INPUT SIGNALS TO AN INTERNAL LOGIC BLOCK

Yukio Suzuki, Hinode; Ikuro Masuda; Masahiro Iwamura, both of Hitachi; Shinji Kadono, Fussa; Akira Uragami, Takasaki; Masayoshi Yoshimura, Maebashi, and Toshiaki Matsubara, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

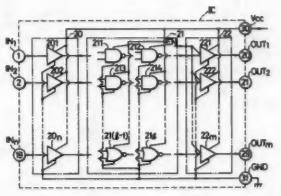
Continuation of Ser. No. 240,450, Sep. 2, 1988, which is a continuation of Ser. No. 102,245, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 8,467, Jan. 29, 1987, abandoned, which is a continuation of Ser. No. 575,567, Jan. 31, 1984, Pat. No. 4,689,503. This application Oct. 31, 1989, Ser. No. 429,489

Claims priority, application Japan, Jan. 31, 1983, 58-12711; Jan. 31, 1983, 58-12712; Jan. 31, 1983, 58-12713

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] H03K *17/04*

U.S. Cl. 307—446 **62 Claims**



1. A semiconductor integrated circuit comprising:

(1) an input circuit having input and output terminals, said input circuit performing a switching operation responding to an input signal received at said input terminal and including means for providing an output signal at said output terminal, said means for providing the output signal in said input circuit including:

a first bipolar transistor having a collector-emitter path coupled between a first potential terminal and said output terminal, and a base coupled to receive a base drive signal responding to said input signal, said first bipolar transistor executing one of a charge and a discharge of a capacitance of said output terminal,

switching means coupled between said output terminal and a second potential terminal and responsive to said input signal on said input terminal and for executing the other of said charge and said discharge of the capacitance, and

aa CMOS circuit having an input responding to said input signal and an output providing said base drive signal for said first bipolar transistor; and

(2) an internal logic block including a plurality of gate circuits, said internal logic block performing logic operations on input signals received at input terminals of said plurality of gate circuits and generating output signals based

upon the login operations at output terminals of said plurality of gate circuits, wherein said output terminal of said input circuit is commonly connected with input terminals of ones of said plurality of gate circuits in accordance with a predetermined gate array type arrangement,

wherein the logic operations of said internal logic block is determined in accordance with the predetermined gate array type arrangement, and

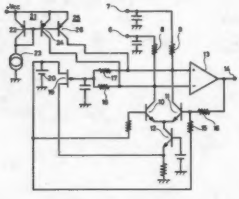
wherein said plurality of gate circuits of said internal logic block are formed in accordance with the predetermined gate array type arrangement to include a plurality of quasi-CMOS circuits and a plurality of CMOS circuits, input stages of said quasi-CMOS circuits being comprised of P-channel and N-channel MOSFETs and output stages of said quasi-CMOS circuits being comprised of bipolar transistors, each of said CMOS circuits including P-channel and N-channel MOSFETs.

4,983,863

LOGARITHMIC AMPLIFICATION CIRCUIT FOR OBTAINING OUTPUT VOLTAGE CORRESPONDING TO DIFFERENCE BETWEEN LOGARITHMICALLY AMPLIFIED VALUVES OF TWO INPUT CURRENTS

Masaya Tanno, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 19, 1989, Ser. No. 381,922
Claims priority, application Japan, Jul. 20, 1988, 63-180516
Int. Cl.[5] G01K *15/10*; G06G *7/12*
U.S. Cl. 307—492 **4 Claims**



1. A logarithmic amplification circuit comprising:

means for supplying a first input current;

means for supplying a second input current;

a first transistor having a collector operably connected to said first input current supplying means and being supplied with said first input current, said first transistor further having an emitter and a base;

a second transistor having a collector operably connected to said second input current supplying means and being supplied with said second input current, said second transistor further having an emitter and a base, said second transistor being differentially connected to said first transistor;

comparing circuit means having input ends connected to respective collectors of said first and second transistors, and an output end for supplying a signal corresponding to a difference between said first and second input currents, said output end being connected to said base of said second transistor; and

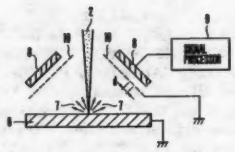
first and second constant current circuit means for supplying compensating currents equivalent to each other to said respective collectors of said first and second transistors, whereby output voltage corresponding to a difference between a logarithmically amplified value of said first input current and a logarithmically amplified value of said second input current can be obtained from said output end of the comparing circuit means.

4,983,864

ELECTRONIC BEAM DRAWING APPARATUS

Fumio Murai, Tokyo, and Shinji Okazaki, Urawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 328,854
Claims priority, application Japan, Mar. 30, 1988, 63-74292
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.2 **5 Claims**



1. An electron beam drawing apparatus for maintaining high positional precision during extended periods of usage comprising:

a device for generating an electron beam;

a device for controlling a shape of the generated electron beam;

a device for deflecting the controlled electron beam;

a stage for placing a specimen to be subjected to a drawing by use of the deflected electron beam;

a detector means disposed relative to the specimen for detecting a reflected electron obtained when an electron is irradiated onto the specimen by an electron beam; and

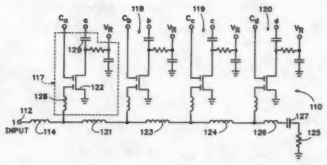
a grounded conductor disposed immediately before the detector for a screening operation in immediate proximity of a surface of said detector to be exposed to the reflected electron, said conductor having an opening for passing therethrough the reflected electron wherein the screening operation screens an electric field generated by charges accumulated within insulating substances fixed to the detector.

4,983,865

HIGH SPEED SWITCH MATRIX

Pang-Ting Ho, Mountain View, and Sanjay B. Moghe, San Jose, both of Calif., assignors to Pacific Monolithics, Sunnyvale, Calif.

Filed Jan. 25, 1989, Ser. No. 301,491
Int. Cl.[5] H03K *17/687, 17/56*
U.S. Cl. 307—571 **20 Claims**



1. A switch matrix, usable with control means generating switch control signals, comprising:

an input terminal and first and second output terminals;

first field-effect transistor (FET) switch means controllable for coupling selectively said input terminal to said first output terminal, and having two gates and a drain, a first of said gates of said first FET switch means being coupled to said input terminal, the second of said gates of said first FET switch means being connectable to the control means for receiving a control signal, and said drain of said first FET switch means being coupled to said first output terminal; and

second field-effect transistor (FET) switch means also having two gates and a drain, a first of said gates of said second FET switch means being coupled to said input terminal, the second of said gates of said second FET switch means being connectable to the control means for receiving a control signal, and said drain of said second FET switch means being coupled to said second output terminal.

4,983,866

ENCAPSULATED ARMATURE FOR ELECTRIC MOTOR

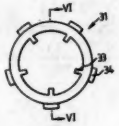
King K. Lok, Elegant Garden Central, Hong Kong, assignor to Johnson Electric S.A., La Chaux de Fonds, Switzerland

Filed Jul. 3, 1989, Ser. No. 375,320

Claims priority, application United Kingdom, Jul. 6, 1988, 8816051

Int. Cl.[5] H02K *13/06, 11/00*

U.S. Cl. 310—43 6 Claims



1. An armature for an electric motor comprising a motor shaft, core mounted on the shaft having pole pieces separated by open slots, windings wound on the pole pieces and partially filling the open slots, a commutator mounted on the shaft and axially displaced from the core, the commutator having a plurality of segments with slots therebetween and the windings being connected to the ends of the segments adjacent the core, a body of insert molded plastic material filling the open slots encapsulating the windings and wires of the windings connecting the windings to the commutator segments, and a ring fitting snugly over the commutator segments adjacent said ends of the segments, said ring comprising a plurality of arms which extend into the slots between the commutator segments, the ring preventing flow of plastic material from the direction of the core towards the commutator and along the slots between the commutator segments during insert molding of the body of plastic material.

4,983,867

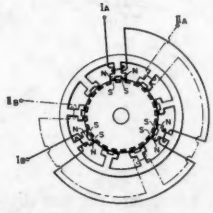
HYBRID-TYPE STEPPING MOTOR

Masafumi Sakamoto, Kiryu, Japan, assignor to Japan Servo Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1990, Ser. No. 544,902

Int. Cl.[5] H02K *37/00*

U.S. Cl. 310—49 R 8 Claims



1. An inner rotor hybrid type stepping motor, wherein a rotor includes two rotary plates having a multiplicity of gear-like salient poles, and includes a permanent magnet sandwiched between the rotary plates and magnetized in the same direction as a rotary shaft, the gear-like salient poles of the two rotary plates being disposed with a half pitch displaced relative to each other, and wherein m stator magnetic poles are disposed opposing a rotor surface with an air gap interposed therebetween and radially at equal pitches over 360 degrees, each of portions of the stator magnetic poles opposing the rotor has a plurality of teeth the same in number and having a pitch substantially equal to a rotor tooth pitch, and each main pole is wound with a winding, the improvement in which

when the number of the gear-like salient poles of the rotor is represented by z, and n is an integer equal to or larger than 1 ($n \geqq 1$), and magnetic polarities of adjacent stator magnetic poles are opposite polarities to each other by switching phase excitation, the following relationships are satisfied:

$m=9$, and the stator is a 3-phase winding stator,

it is set that $z=9n \pm 3$.

4,983,868

DISENGAGEABLE LINEAR STEPPER MOTOR

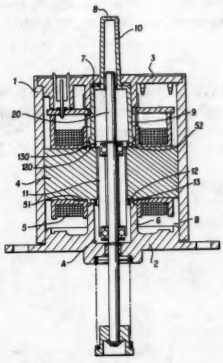
Gilbert Spiesser, Ales, France, assignor to Sextant Avionique, Montrouge, France

Filed Mar. 20, 1989, Ser. No. 325,967

Claims priority, application France, Mar. 21, 1988, 88 03779

Int. Cl.[5] H02K *37/14*

U.S. Cl. 310—49 R 3 Claims



1. A disengageable linear stepper electric motor comprising a multipole stator in the bore of which a rotor of smaller diameter revolves cycloidally, said motor further comprising sealing means disposed between the rotor environment and the stator environment for isolating said stator environment and so the environment outside the motor, from said rotor environment wherein said sealing means comprise resilient means and rigid means for supporting said resilient means and compressing them against two cylindrical annular surfaces integral respectively with the two ends of the bore of said stator and against the edges of two cylindrical sleeves housing said rotor.

4,983,869

MAGNETIC BEARING

Jayant Vaidya, and Raghunath G. Mokadam, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 8, 1989, Ser. No. 390,712

Int. Cl.[5] F16C *39/06*

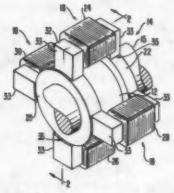
U.S. Cl. 310—90.5 29 Claims

1. A magnetic bearing comprising:

a rotatable member, having a cylindrical magnet with first and second ends which respectively are first and second magnetic poles with a magnetic field produced by the magnet having a uniform strength around a circumference of the first and second ends and first and second magneti-

cally permeable annular pole pieces, the first annular pole piece facing the first end of the cylindrical magnet and the second annular pole piece facing the second end of the cylindrical magnet; and

a magnetic field generator, responsive to a force applied to the rotatable member causing movement of the rotatable member from a uniform spacing with respect to annuli



surrounding the rotatable member, for producing a magnetic field generated by at least one electromagnet coupled to the pole pieces which is summed with the magnetic field produced by the cylindrical magnet and opposes the force which caused movement of the rotatable member from the uniform spacing to cause movement of the rotatable member back to the uniform spacing.

4,983,870

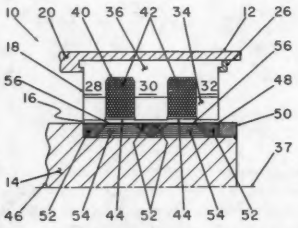
RADIAL MAGNETIC BEARING

Lloyd W. McSparran, Pittsburgh, Pa., assignor to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Jul. 26, 1989, Ser. No. 385,798

Int. Cl.[5] F16C *39/00*

U.S. Cl. 310—90.5 **15 Claims**



1. A magnetic bearing for rotatably supporting a rotor element comprising,

a magnetic flux carrying member carried by the rotor element,

a stator element surrounding in spaced relation said magnetic flux carrying member,

a plurality of at least three electromagnets supported by said stator element around the periphery of said magnetic flux carrying member to generate a force of attraction on the rotor element,

each of said electromagnets being formed by a plurality of planar laminations extending longitudinally parallel to the axis of rotation of the rotor element,

each of said laminations having a plurality of legs forming pole tips positioned in close proximity to the surface of said magnetic flux carrying member to form an air gap therebetween,

magnetizing coils extending around said legs of said laminations,

power means for supplying said magnetizing coils with electrical currents to generate magnetic forces upon said magnetic flux carrying member, and

means associated with said magnetic flux carrying member for minimizing eddy current losses in the rotor and allow rapid rates of change in flux density.

4,983,871

COMMUTATOR WITH BASE ALIGNMENT INTERLOCK

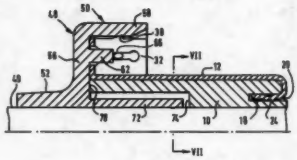
Georg Strobl, Hong Kong, Hong Kong, assignor to Johnson Electric S.A., La Chaux de Fonds, Switzerland

Filed Aug. 2, 1989, Ser. No. 388,380

Claims priority, application United Kingdom, Aug. 4, 1988, 8818577

Int. Cl.[5] H02K *13/04, 15/00;* H01R *43/06*

U.S. Cl. 310—234 **8 Claims**



1. An armature for an electric motor, comprising a winding having connector portions, a plurality of commutator segments each having an integral terminal provided with means defining a slot, said means straddling and gripping a respective connector portion, a commutator base for supporting said segments and a separate terminal support having a plurality of receiving housings in which the terminals are located when the support and base are brought together, wherein alignment means is provided for aligning the commutator base circumferentially with respect to the terminal support as they are brought together, wherein the alignment means causes the terminal support and commutator base to be aligned before the terminals are received in the housings.

4,983,872

BRUSH GEAR FOR A PERMANENT MAGNET MOTOR

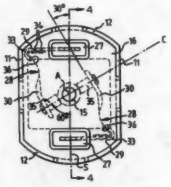
Georg Strobl, Repulse Bay, Hong Kong, assignor to Johnson Electric S.A., La Chaux de Fonds, Switzerland

Filed May 30, 1989, Ser. No. 357,946

Claims priority, application United Kingdom, Jun. 6, 1988, 8813370

Int. Cl.[5] H02K *5/14;* H01R *39/38;* H02K *13/00*

U.S. Cl. 310—239 **8 Claims**



7. A permanent magnet direct current electric motor comprising a casing having a pair of opposed planar side walls and a pair of opposed curved walls between the planar side walls, a permanent magnet located inside each curved wall, a wound armature mounted for rotation about a motor axis in the casing having armature coils wound respectively around three evenly distributed arms, a commutator having three evenly distributed segments each having at one end a tang positioned be-

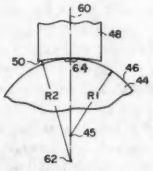
tween respective adjacent pairs of coils of the armature and each electrically connected to said respective pair of coils, and two brush arms supported by a holder at one end of the casing, each brush arm comprising two electrically conductive strips forming, respectively, a terminal part and a more resilient brush supporting part, the terminal parts each having first and second limbs and being supported by the holder with the first limbs extending outwardly of the casing at said one end thereof in a plane of symmetry of the motor casing, which plane passes through the motor axis and bisects the curved walls of the casing, and the brush supporting parts being secured to the respective second limbs of the terminal parts at positions which are offset from the plane of symmetry on opposite sides thereof, the second limbs each having a bend to form an acute angle having an apex adjacent a respective side wall of the casing.

4,983,873

ELECTRICAL BRUSH ASSEMBLY

Noriyuki Tanaka, and Hiroyuki Morikane, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 450,103
Claims priority, application Japan, Dec. 14, 1988, 63-316915
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—248 **2 Claims**



1. An electrical brush assembly for use with a d.c. dynamoelectric machine including a commutator (**44**) having a substantially cylindrical commutator contact surface (**46**), comprising:

an elongate electrical brush element (**48**) having a sliding contact surface (**50**) at one end engageable with said contact surface of said commutator, and a side support surface;

a brush holder (**54**) for slidably supporting said brush element such that said side support surface of said brush element is slidably supported for a sliding movement of said brush element relative to said commutator of the d.c. dynamoelectric machine substantially along a diameter of said commutator, and such that said contact surface of said brush element can be disposed in sliding contact with said contact surface of said commutator; and

means (**58**) for urging said sliding contact surface of said brush element against said contact surface of said commutator;

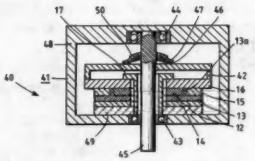
wherein said sliding contact surface of said brush element is a single, continuous, concave cylindrical surface having a central axis (**62**) substantially parallel to a central axis (**45**) of said commutator contact surface, and has a radius (**R2**) of from 1.2 to 2.5 times larger than a radius (**R1**) of said commutator contact surface to establish a partial surface contact between said commutator contact surface and said brush element contact surface, and wherein a longitudinal axis (**60**) of said brush element substantially lies in a plane including said central axes of said commutator contact surface and said sliding contact surface of said brush element.

4,983,874

VIBRATOR AND ULTRASONIC MOTOR EMPLOYING THE SAME

Masaki Yamaguchi, Gifu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 3, 1989, Ser. No. 375,380
Claims priority, application Japan, Jul. 5, 1988, 63-168501
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 **13 Claims**



1. A vibrator comprising:

a resonant member having a central hole defined therein and a circumferential portion;

first exciting means for exciting circumferential shearing vibration in said resonant member such that said circumferential portion and said hole are positioned at antinodes of the circumferential shearing vibration about said hole; and

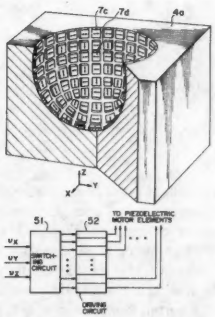
second exciting means for exciting vertical vibration or flexural vibration in said resonant member in a direction different from the direction in which the circumferential shearing vibration is excited by said first exciting means.

4,983,875

ACTUATOR

Ryoso Masaki; Masahiro Kayama, both of Hitachi; Hiroshi Hayashida, Kure; Hideki Nibei, Hitachi; Yasunori Katayama, Mito; Hiroshi Nagase, Hitachi; Toshihiko Matsuda, Hitachi, and Kenzo Kamiyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 367,663
Claims priority, application Japan, Jun. 20, 1988, 63-150308; Sep. 8, 1988, 63-225269
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 **27 Claims**



1. An actuator comprising:

a hollow driving member having a mounting portion and a substantially spherical inner surface with an opening spaced from said mounting portion;

a first group of piezoelectric motor elements adapted to generate progressive waves in a first direction;

a second group of piezoelectric motor elements adapted to

generate progressive waves in a second direction different from said first direction;

said piezoelectric motor elements of said first and second groups being arranged alternately and disposed on said substantially spherical inner surface of said driving member;

a driven member having a substantially spherical section and an arm section, said substantially spherical section having a substantially spherical outer surface disposed in a closely spaced face-to-face relationship with said substantially spherical inner surface of said driving member, said first and second groups of piezoelectric motor elements being disposed therebetween; and

a power source for supplying voltages to said first and second groups of piezoelectric motor elements.

4,983,876

PIEZOELECTRIC PUMP ASSEMBLY

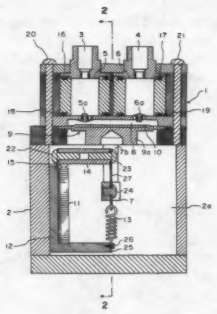
Satoshi Nakamura; Teruo Simizu; Reizo Naruse, and Hiroyuki Igawa, all of Tokyo, Japan, assignors to Nippon Keiki Works, Ltd., Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 386,658

Claims priority, application Japan, Aug. 11, 1988, 63-200947

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—328 **1 Claim**



1. A piezoelectric diaphragm pump assembly, wherein there is disposed a housing having an inlet port provided with a feed check valve, and an outlet port provided with a discharge check valve, wherein a casing is disposed for accomodating an amplification mechanism, said casing having an L-shape stationary member, to which a plate spring is fixed, a front end portion of the plate spring being fixed with a lever member of the amplification mechanism, which is engaged with an upper portion of a longitudinally effective type piezoelectric actuator, and wherein a diaphragm body coated with a film is disposed, characterized in that a front end portion of the lever member is fixed with a supporting member which is, in turn, fixed with a Ushape supporting member for supporting the diaphragm body, and that the supporting member is connected via a spring to the L-shape stationary member.

4,983,877

IGNITION PLUG FOR USE IN INTERNAL COMBUSTION ENGINES TO CAUSE INSTANTANEOUS COMBUSTION

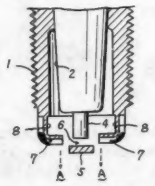
Ryohei Kashiwara, Raitsu Ootori 106, 456-1, Ootori-kitamachi 8-cho, Sakai-shi, Osaka-fu; Hideaki Kashiwara, 3-B, 611, 151-30, Ninomaru-cho Mukojima, Fushimi-ku, Kyoto-shi; Hidehiko Noguchi, 7-14, Taiho 3-chome, Kanan-cho, Minamikawachi-gun, Osaka-fu, and Takeaki Kashiwara, 3,37-411, Nagayoshidedo 3-chome, Hirano-ku, Osaka-shi, all of Japan

Filed Apr. 4, 1989, Ser. No. 333,038

Claims priority, application Japan, Apr. 12, 1988, 63-89681

Int. Cl.[5] H01T *13/32, 13/46*

U.S. Cl. 313—140 **14 Claims**



1. An ignition plug for use in an internal combustion engine comprising a metal casing, a cylindrical high tension center electrode axially disposed in the metal casing, a ground electrode extending from the casing, said ground electrode having a substantially L-shape with a first leg extending substantially axially from the metal casing and a second leg having a free end extending radially inward and axially spaced from a terminal end of the center electrode to define a spark gap, said second leg having a length and width greater than a diameter of the center electrode; a plurality of substantially L-shaped ignition means having a first leg extending axially from the metal casing and a second leg extending radially inward toward said center electrode and having a free end radially spaced from the center electrode, wherein said ignition means is provided with an ignition groove on an outer surface opposite the center electrode and said ignition groove defining an axis directed toward the spark gap, and wherein the spaces between the free end of the ignition means and the center electrode are equal and wherein each space between the free end of the ignition means and the center electrode is greater than the spark gap.

4,983,878

FIELD INDUCED EMISSION DEVICES AND METHOD OF FORMING SAME

Rosemary A. Lee, Northwood, England; Nandasiri Samarakone, Kessello, Belgium, and Neil A. Cade, Rickmansworth, England, assignors to The General Electric Company, p.l.c., England

Filed Aug. 24, 1988, Ser. No. 235,471

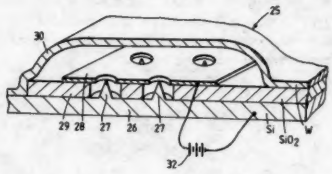
Claims priority, application United Kingdom, Sep. 4, 1987, 8720792

Int. Cl.[5] H01J *1/30, 1/46, 9/14*

U.S. Cl. 313—308 **19 Claims**

17. A switching device, comprising a substrate; a plurality of cathode bodies formed on said substrate; an electrically-insulating layer deposited over said substrate and having a plurality of apertures therethrough through which said cathode bodies are revealed; a strip of electrically-conductive material supported by said insulating layer to act as a control electrode and having apertures therein corresponding to said apertures in said insulating layer; and a layer of electrically-conductive material spaced from the control electrode to act as an anode; wherein said substrate, said control electrode and said anode are so dimensioned and spaced as to form at least a

section of a transmission line; and wherein said cathode bodies are structured for field-induced electron emission therefrom at



a cathode-control electrode voltage less than will cause breakdown of said insulating layer.

4,983,879

SHADOW MASK TYPE COLOR CATHODE RAY TUBE WITH SHADOW MASK EFFECTIVE TO MINIMIZE THE APPEARANCE OF MOIRE PATTERNS

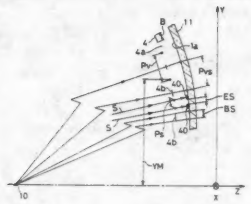
Takeo Kawaguchi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 14, 1988, Ser. No. 284,326

Claims priority, application Japan, Dec. 17, 1987, 62-322179

Int. Cl.[5] H01J *29/81*

U.S. Cl. 313—402 **14 Claims**



1. A color cathode ray tube comprising:

evacuated envelope means having a phosphor deposited screen and an electron gun assembly, positioned in opposition to said phosphor deposited screen, for emitting electron beams towards said phosphor deposited screen; and

apertured shadow mask means disposed inside said evacuated envelope means generally parallel and in the vicinity spaced a predetermined distance from said phosphor deposited screen for partially blocking said electron beams from impinging upon said phosphor deposited screen,

said apertured shadow mask means having a pattern of minute apertures with intervening bridges, the pitch between each of the neighboring apertures measured in a vertical direction perpendicular to a horizontal scanning line is variable as a function of distance away form an X-axis parallel to the horizontal scanning line including the center of said apertured shadow mask means or of distance away from a Y-axis perpendicular to said X-axis satisfying the relationship

$$[(Ps-Es)/Ps]\cdot[(Pvs-Bs)/Pvs]=\text{constant}$$

wherein Pvs represents bridge pitch between respective shadows of neighboring bridges projected upon said phosphor deposited screen, Bs represents shadow size of said bridge projected upon said phosphor deposited screen, Ps represents an interval between neighboring horizontal scanning lines on said phosphor deposited screen, and Es represents shadow size formed on said phosphor deposited screen between neighboring horizontal scanning lines, to minimize the effects of Moire patterns formed on said phosphor deposited screen.

4,983,880

EDGE BREAKDOWN PROTECTION IN ACEL THIN FILM DISPLAY

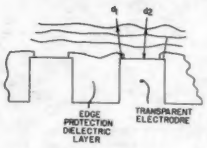
Mohamed I. Abdalla, Beverly; Lawrence L. Hope, Maynard, and Timothy Fohl, Carlisle, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 944,692, Dec. 19, 1986, abandoned.

This application Aug. 8, 1990, Ser. No. 565,870

Int. Cl.[5] H05B *33/22*

U.S. Cl. 313—506 **11 Claims**



1. An Ac tin film electroluminescent display device comprising:

a multilayer stack including a first dielectric layer; a phosphor layer; and a second dielectric layer; situated on a glass substrate which includes parallel stripes of etched transparent conductors;

said multilayer stack further including plural protective stripes of dielectric material placed at least along the edges of the transparent conductors.

4,983,881

HIGH-POWER RADIATION SOURCE

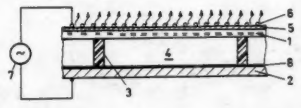
Baldur Eliasson, Birmenstorf, and Ulrich Kogelschatz, Hausen, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jan. 11, 1989, Ser. No. 295,743

Claims priority, application Switzerland, Jan. 15, 1988, 00152/88

Int. Cl.[5] H01J *17/06, 61/06, 61/42*

U.S. Cl. 313—607 **36 Claims**



1. A high-power radiation source comprising:

(a) a first dielectric having a first side and a second side;

(b) a first electrode located on the first side of said first dielectric;

(c) a second electrode located on the second side of said first dielectric;

(d) a discharge space located between said first dielectric and said second electrode;

(e) a filling gas which forms excimers under silent electric discharge conditions filling said discharge space and emitting ultra-violet radiation;

(f) an alternating power source connected to said first and second electrodes;

(g) a first luminescent coating located on said first dielectric;

(h) a second dielectric located between said second electrode and said discharge space; and

(i) a second luminescent coating located on said second dielectric,

(j) wherein said first and second luminescent coatings are respectively located on the surfaces of said first and second dielectrics remote from said discharge space.

4,983,882

IGNITION AMPLIFIER DEVICE

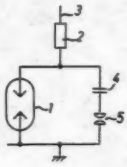
Arnold Mayring, Las Palmas de Gran Canaria, Spain, assignor to Isotec AG, Switzerland

Continuation of Ser. No. 8,214, Jan. 28, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 222,318

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3603025

Int. Cl.[5] H01J 7/44; H01T 13/46; F02P 15/00; H01R 13/44

U.S. Cl. 315—59 14 Claims



1. An ignition amplifier device for use with a spark plug in enhancing the spark generated at a first spark gap created by the first and second electrodes of the spark plug, comprising:

a condenser;

third and fourth electrodes, defining a second spark gap, electrically connected in series with the condenser to form an amplifier circuit; and

means for connecting the amplifier circuit in parallel with the electrodes of the spark plug.

4,983,883

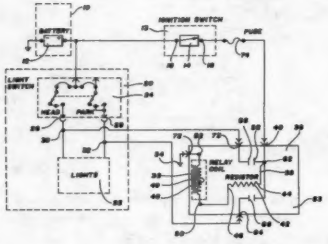
AUTOMATIC ILLUMINATION CIRCUIT

George R. Roland, 42100 Riggs, Belleville, Mich. 48111

Filed Apr. 4, 1989, Ser. No. 333,115

Int. Cl.[5] B60Q 1/02

U.S. Cl. 315—77 13 Claims



1. In an automotive vehicle having a source of electrical energy, an ignition system including an ignition switch coupled to the source, the ignition switch being operable in a first operating state for rendering the engine operable, a lighting system adapted to be energized by the source, the lighting system including at least one light selected from the group consisting of at least one light, at least one park light and at least one illuminated sign, and at least one light switch coupled to the source for energizing the at least one light;

an automatic illumination circuit including a single relay control mechanism, said circuit coupled to the ignition switch and in parallel with the at least one light switch for continuously energizing the at least one light when the ignition switch is in the first operating state and the source supplies electrical energy to the automatic illumination circuit, the automatic illumination circuit further including a first pair of normally open points connected to the relay control mechanism including a relay coil, and a resistor coupled between the relay control mechanism and a pair of normally open points, the resistor decreasing the current flowing to the relay control mechanism, the relay control mechanism becoming energized and closing the first pair of normally open points when sufficient current is delivered to the relay coil, thereby delivering electrical current to the at least one light.

4,983,884

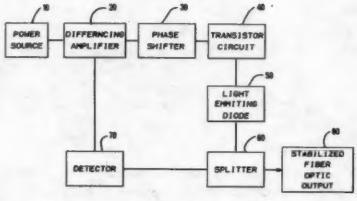
CONSTANT INTENSITY LIGHT SOURCE FOR FIBER OPTIC TESTING

William C. Wychulis, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1989, Ser. No. 400,307

Int. Cl.[5] H05B 37/02; G01J 1/32

U.S. Cl. 315—151 3 Claims



1. A supply circuit for a stable fiber optic light comprising;

a power circuit responsive to a control signal and comprising a power source, a comparing and amplifying means for comparing the voltage of the power source with the voltage of a stabilized electrical control signal and for emitting, in response thereto, an amplified electrical signal proportional to the difference between the power source voltage and the stabilized electrical control signal voltage, and a transistor circuit to increase or decrease the current from the power source in response to the amplified electrical signal from the comparing and amplifying means; and

a stable light-emitting system comprising a semi-conductor light source for generating optical power in proportion to the signal from the power circuit, and a feedback control system comprising means for determining a signal characteristic of the optical power generated by the semi-conductor light source and in response thereto, generating the electrical control signal for control of the power circuit as aforesaid; wherein the feedback control system comprises;

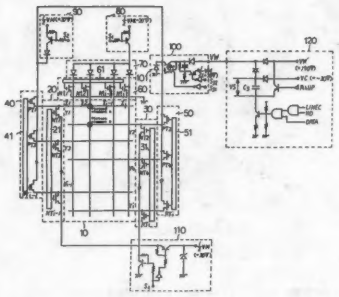
a mixing rod for conveyance of the optical power, a splitter for receiving the optical power from the mixing rod and for splitting the power into at least a fiber optic product portion and a fiber optic control portion, and a detector for sensing the fiber optic control portion and for producing, in response thereto, the electrical control signal for control of the power circuit.

4,983,885

THIN FILM EL DISPLAY PANEL DRIVE CIRCUIT

Yoshihide Fujioka; Shigeyuki Harada; Toshihiro Ohba; Yoshiharu Kanatani, all of Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 20,578, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 780,177, Sep. 26, 1985, Pat. No. 4,686,428. This application Nov. 29, 1988, Ser. No. 277,420
Claims priority, application Japan, Sep. 28, 1984, 59-205428
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[5] G09G *3/10*
U.S. Cl. 315—169.3 **13 Claims**



1. A thin-film matrix display panel drive circuit comprising:
driving voltage means for providing a driving voltage to said matrix display panel;
first switching elements connected to scan side electrodes;
second switching elements connected to scan side electrodes and said driving voltage means,
first activating mans for activating said first switching elements to apply write pulses to picture elements on said scan side electrodes to which said first switching elements are connected;
second activating means for activating said second switching elements to apply write pulses to picture elements on said scan side electrodes to which said second switching elements are connected;
voltage compensating means for compensating for voltage drops in said second switching elements by adding voltage to said driving voltage supplied by said driving voltage means, said compensation being determined in accordance with variations in the number of emitting picture elements.

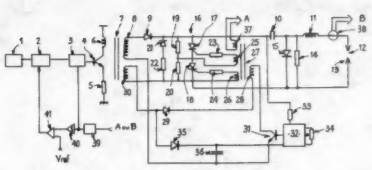
4,983,886

HIGH-ENERGY IGNITION GENERATOR ESPECIALLY FOR A GAS-TURBINE

Patrick Balland, Rueil Malmaison, France, assignor to Labo Industrie, Nanterre Cedex, France

Filed Sep. 18, 1989, Ser. No. 408,557
Claims priority, application France, Sep. 20, 1988, 88 12272
Int. Cl.[5] H05B *41/36*
U.S. Cl. 315—209 CD **10 Claims**

1. High-energy ignition generator of the type including an energy source (1) connected to a first circuit comprising an energy storage capacitor (10), an inductor (11) and an ignition plug (12), in series, a free-wheel diode (15) being connected in parallel with the terminals of the inductor (11) and the ignition plug (12) and means of short-circuiting (16) the first circuit so as to generate sparks between the electrodes of the plug (12), characterized in that the means of short-circuiting (16) include at least one semi-conductor switching device (17,18) controlled by means for comparison (32) of the voltage at the terminals of the storage capacitor (10) with a first reference voltage, and in that means of control (2,3,4,7; 39,40,41) of the charging of the capacitor (10) at a first rate (R1) during an



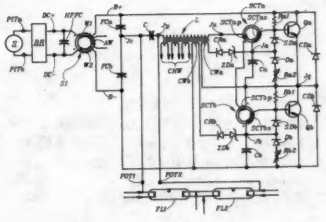
initial period of time and at a second rate (R2) during a second period of time, the second rate being higher than the first, are interposed between the energy source (1) and the first circuit.

4,983,887

CONTROLLED SERIES-RESONANCE-LOADED BALLAST

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 80,865, Aug. 13, 1987, Pat. No. 4,819,146. This application Jan. 19, 1989, Ser. No. 298,684
Int. Cl.[5] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—224 **13 Claims**



1. An arrangement comprising:
a source of DC voltage;
inverter means connected with the source of DC voltage and operative to provide an alternating output current from an output, the alternating current having a frequency and a period;
lamp means connected with the output by way of frequency-responsive circuit means; and
sensor and control means connected in circuit with the inverter means, the sensor and control means being responsive to the average magnitude of the output current and operative to cause the frequency of the output current to change in response thereto, thereby to correspondingly affect the magnitude of any current provided to the lamp means, the average magnitude of the output current being defined as the absolute magnitude of the output current as averaged over at least one complete period thereof.

4,983,888

FLUORESCENT LAMP DEVICE

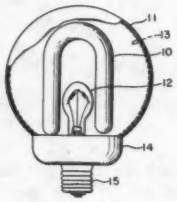
Hidezoh Akutsu, Kobe, and Haruo Yamazaki, Moriyama, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 5, 1985, Ser. No. 698,437
Claims priority, application Japan, Feb. 8, 1984, 59-22157
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—242 **11 Claims**

1. A fluorescent lamp device comprising:
a discharge tube coated on an inner surface thereof with a

phosphor, having at least mercury sealed therein and including an anode electrode and a cathode electrode;

a direct-current circuit connected to said discharge tube for operating said discharge tube; and



an amalgam forming material arranged close to said anode electrode of said discharge tube, said direct current circuit including a positive pole connected to said anode electrode, said amalgam forming material forming an amalgam with said mercury in said discharge tube in response to operation of said discharge tube.

4,983,889

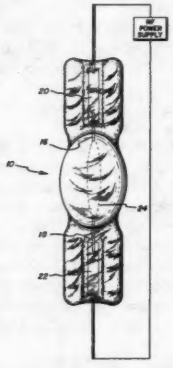
DISCHARGE LAMP USING ACOUSTIC RESONANT OSCILLATIONS TO ENSURE HIGH EFFICIENCY

Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1989, Ser. No. 351,904

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—246 **14 Claims**



10. A method of operating a low pressure electroded metal halide arc lamp having a fill enclosed by an arc tube, which method comprises igniting an arc within said fill by exciting said fill with acoustic oscillations at a resonant frequency for said arc tube, said acoustic oscillations at the resonant frequency producing a substantially uniform mixing of the ingredients comprising said fill so that efficacy is improved and said arc is substantially straight within said arc tube.

4,983,890

ROTATING DRIVE DEVICE

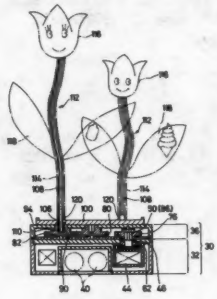
Yasuta Satoh, Nagareyama; Shigeru Nakane, Narashino, and Hitoshi Yoneyama, Saitama, all of Japan, assignors to Takara Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 411,672

Claims priority, application Japan, Sep. 29, 1988, 63-245338; Feb. 21, 1989, 1-41341; Feb. 21, 1989, 1-41342; Feb. 21, 1989, 1-41343

Int. Cl.[5] G09F *19/08*; A63H *13/02*

U.S. Cl. 318—3 **4 Claims**



1. A rotating drive device comprising:

a drive mechanism unit including a casing, a power supply, a sensor, and a motor each arranged in said casing, and an output shaft operatively connected to said motor, said motor being electrically connected to said power supply and sensor so as to be actuated when said sensor detects an external stimulus, and

a transmission mechanism unit detachably connected to said drive mechanism unit through said output shaft, said transmission mechanism unit including an input section operatively connected to said output shaft of said drive mechanism unit to transmit the power of said drive mechanism unit to said transmission mechanism unit and a plurality of output sections for transmitting the power of said transmission mechanism unit to the exterior.

4,983,891

MOTOR DRIVING APPARATUS WITH SPEED DETERMINED CHOPPED DRIVE AND CONSTANT VOLTAGE DRIVE CONTROL

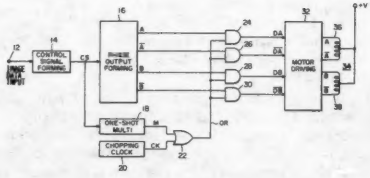
Takashi Sekimoto, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 482,204

Claims priority, application Japan, Mar. 2, 1989, 1-50861

Int. Cl.[5] H02F *7/68*

U.S. Cl. 318—66 **2 Claims**



1. A motor driving apparatus for a stepper motor for use in a facsimile machine, comprising:

means for generating a control signal to control the stepper motor at a speed corresponding to image data to be trans-

mitted or reproduced, said control signal having a pulse width which decreases with increasing motor speeds;

means for coverting said control signal to phase signals wherein each of said phase signals is delayed a predetermined period relative to a preceding phase signal;

pulse generating means including chopping clock means for producing a chopping clock signal, for generating pulse signals in response to said control signal, and wherein said pulse generating means further includes means for generating said chopping clock signal to control said motor for low speed operation, and for generating a continuous signal to control said motor for high speed operation; and

means for generating motor driving signals wherein a chopping drive signal is produced to drive said motor during said low speed operation in accordance with said phase signals and with said chopping clock signal from said pulse generating means, and a continuous drive signal is produced to drive said motor during said high speed operation in accordance with said phase signals and with said continuous signal from said pulse generating means.

4,983,892

MECHANISM FOR CONTROLLING ELECTRICALLY DRIVEN ANTENNA

Mitsuhiro Suga, Ageo, and Akio Takizawa, Tokyo, both of Japan, assignors to Nippon Antenna Co., Ltd., Tokyo, Japan

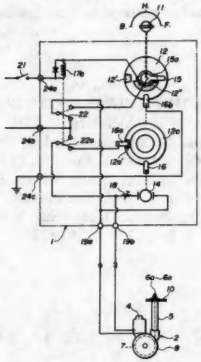
PCT No. PCT/JP87/00020, § 371 Date Jul. 18, 1988, § 102(e) Date Jul. 18, 1988, PCT Pub. No. WO87/04567, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 14, 1987, Ser. No. 254,778

Claims priority, application Japan, Jan. 16, 1987, 61-4897; Apr. 11, 1987, 61-82329; Dec. 12, 1987, 61-190486[U]

Int. Cl.[5] G05B *1/06*

U.S. Cl. 318—98 **7 Claims**



1. A mechanism for controlling an electrically driven antenna comprising;

a transmitting and receiving circuit;

an antenna motor power supply circuit operatively connected in parallel with the transmitting and receiving circuit;

independent contactor control means including a rotary contactor with a motor, for responding to control commands, given by a manipulating portion;

the manipulating portion for giving the control commands to said independent contactor control means, said manipulating portions adapted to pre-set selected amounts of antenna extension and contraction in said independent contactor control means; and

a changeover means for performing ON/OFF operations for current supply to the antenna motor power supply circuit, the motor of the independent contactor control means and the transmitting and receiving circuit, so as to extend and contract the antenna according to the control commands.

4,983,893

ACTUATOR WITH STEPPING MOTION FUNCTION

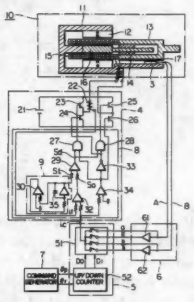
Kunio Miyashita, Hitachi; Hiroshi Hayashida, Mito; Tadashi Takahashi, and Syooichi Kawamata, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,486

Claims priority, application Japan, Dec. 7, 1983, 58-229893

Int. Cl.[5] H02K *33/00*

U.S. Cl. 318—135 **10 Claims**



1. An actuator with a stepping motion function, including a fixed portion and a movable portion constructed in combination so as to be movable relative to each other, an electrical conductor for applying a moving force to the movable portion, and a sensor mounted on either one of the fixed portion and the movable portion for detecting the position of the movable portion, wherein the control of position setting for the movable portion is performed in accordance with the outputs from the sensor; said sensor comprising a plurality of sensors which respectively generate signals different in phase while the movable portion moves, and driving force command means for supplying a driving force command to said conductor by sequentially selecting and changing, in accordance with a position command signal, one of the output signals from said plurality of sensors and signals obtained by processing said output signals, and in which said sensor is made of a magneto resistive element.

4,983,894

BRUSHLESS MOTOR DRIVING SYSTEM

Hiroyuki Oku, Takarazuka; Masshiro Yasohara, Amagasaki, and Hiromitsu Nakano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 24, 1990, Ser. No. 469,320

Claims priority, application Japan, Feb. 1, 1989, 1-022863; Feb. 3, 1989, 1-024997; Sep. 1, 1989, 1-227699

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—138 **3 Claims**

1. A system for driving a brushless motor comprising:

a plurality of motor drive coils of a plurality of phases respectively;

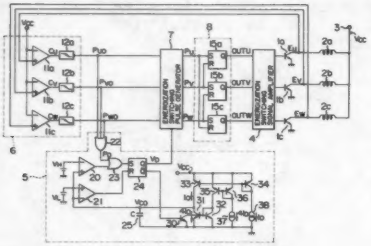
a plurality of drive transistors connected to said drive coils respectively;

an energization switching circuit sequentially transmitting a plurality of energization switching signals to said drive transistors respectively so as to switch over energization of said drive coils;

reference phase detecting means comparing voltages induced in said drive coils with selected one of a neutral point potential of said drive coils and a power supply voltage for detecting a reference phase of rotation of the

rotor of the motor, thereby generating a plurality of reference phase pulse signals corresponding to said plurality of phases respectively;

energization switching pulse generating means for generating a plurality of energization switching pulse signals corresponding to said plurality of phases respectively, when a predetermined delay time has elapsed from the generation of said reference phase pulse signals; and



delay time setting means for setting said predetermined delay time to a value proportional to a period of time from the time of generation of one of said energization switching pulse signals corresponding to said drive coil of one phase to the time of generation of one of said reference phase pulse signals during a de-energization time period of said drive coil of a succeeding phase to be energized next time.

4,983,895

METHOD AND APPARATUS FOR OPERATING VACUUM CLEANER

Haruo Koharagi, Ibaraki; Kazuo Tahara, Hitachi; Tsunehiro Endo, Hitachiota; Kunio Miyashita, Hitachi; Yoshitaro Ishii, Hitachi; Fumio Jyoraku, Hitachi; Syuji Watanabe, Ibaraki; Hisanori Toyoshima, Hitachi; Kohichi Saito, Kitaibaraki; Wakichiro Hishi, Nagareyama, and Koujirou Yamashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 105,598, Oct. 8, 1987, Pat. No. 4,880,747.
This application Jun. 13, 1989, Ser. No. 365,491
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 **2 Claims**

1. An apparatus for operating a vacuum cleaner having a filter to collect dusts and a fan motor to give a suction force to a cleaner, comprising:

a circuit to apply an electric power to said fan motor;

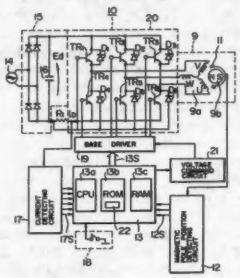
a circuit to detect an actual rotational speed of the fan motor;

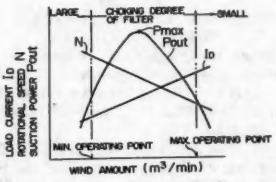
a base driver to control the electric power which is applied to the fan motor;

a microcomputer with a ROM having stored therein a plurality of function tables corresponding to control patterns for a speed command for said fan motor for respective ones of a plurality of different cleaning surfaces, said control pattern being corrected in accordance with a choking state of a vacuum cleaner filter;

means for inputting to the microcomputer the value of the rotational speed derived by said circuit to detect the rotational speed of the fan motor; and

wherein said microcomputer further includes means for selecting one of the function tables on the basis of the value of the actually detected rotational speed and a fluctuation in said rotational speed, comparing the value of the input rotational speed with the control pattern of the





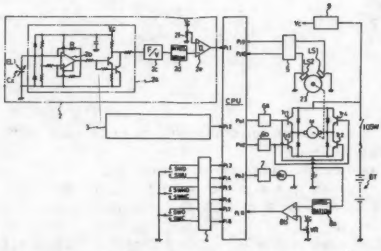
selected function table and giving a new command to said base driver on the basis of said comparison value.

4,983,896

SYSTEM FOR DRIVING AND CONTROLLING AN OPEN-AREA SHIELD

Masanori Sugiyama, Nishio; Takao Shirai, Toyota; Takayoshi Masutani, Toyota, and Isao Yoshikawa, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 2, 1988, Ser. No. 239,730
Claims priority, application Japan, Sep. 2, 1987, 62-219783
Int. Cl.[5] H02P *1/22*
U.S. Cl. 318—286 **6 Claims**



1. A system for driving and controlling an open-area shield, comprising:

an open-area frame member having an opening;

an open-area shielding member defining an open area together with said open-area frame member and made movable for shielding said open area;

drive means for driving said open-area shielding member;

closing drive instructing means for producing a closing drive

instruction to drive said open-area shielding member in a direction to reduce said open area;

a detection electrode disposed in at least one portion of the substantial peripheral edge of said open area;

electrostatic capacity detecting means for detecting the electrostatic capacity of said detection electrode;

obstruction setting means for setting the presence of an obstruction in said open area in accordance with the electrostatic capacity detected by said electrostatic capacity detecting means; and

energization control means for energizing said drive means to close said open-area shielding member in response to said closing drive instruction of said closing drive instruction means and for deenergizing said drive means when said obstruction setting means sets the presence of an obstruction;

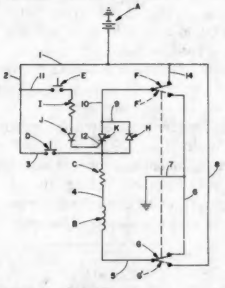
wherein said obstruction setting means sets the presence of an obstruction if the increasing rate of said electrostatic capacity per unit time exceeds a predetermined value causing said energization control means to de-energize said drive means, and the absence of an obstruction if said electrostatic capacity decreases, causing said energization control means to resume energization of said drive means after de-energization.

4,983,897

CONTROL CIRCUIT

James A. Tennant, Perrysville, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Aug. 5, 1988, Ser. No. 228,439
Int. Cl.[5] H02P *1/22*
U.S. Cl. 318—287 **10 Claims**



1. A control circuit for connecting a voltage source to a load and comprising:

an electronic switch coupling said voltage source in a path to said load, said switch having a conducting and a non-conducting state,

means coupled to said switch to hold said switch in said conducting state,

thermal means in series with the said switch and said load to cause a decrease of current flow in said path when said load increases a predetermined amount, and

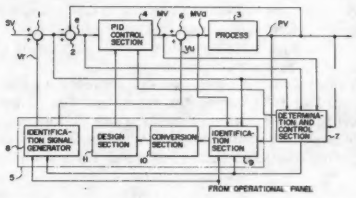
means coupled to said thermal means and said switch holding means for causing said switch to assume the nonconducting state when said thermal means causes said decrease of current flow thereby disconnecting said load from said voltage source.

4,983,898

METHOD AND SYSTEM FOR CHANGING CONTROL PARAMETERS IN ACCORDANCE WITH STATE OF PROCESS IN PROCESS CONTROL

Masae Kanda, Kawagoe, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1990, Ser. No. 482,017
Claims priority, application Japan, Feb. 23, 1989, 1-43492
Int. Cl.[5] G05B *13/04*
U.S. Cl. 318—561 **10 Claims**



1. A method for changing control parameters in accordance with a state of a process in process control, the method comprising the steps of:

monitoring at least one characteristic variable representing the state of the process during a monitoring period to obtain a change pattern of the characteristic variable during the monitoring period;

determining the state of the process in accordance with the obtained change pattern;

calculating the control parameters to control a desired variable supplied to the process when the change pattern represents an insufficient response; and

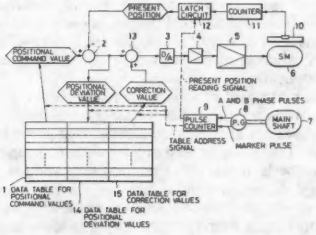
regulating at least one control parameter to control a desired variable supplied to the process when the change pattern represents an unstable response.

4,983,899

NUMERICAL CONTROL APPARATUS FOR CONTROLLING A FEED SHAFT AND MAIN SHAFT OF A MACHINE TOOL

Toshiteru Komatsu, and Kunio Miura, both of Aichi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Jul. 26, 1989, Ser. No. 385,415
Claims priority, application Japan, Jul. 29, 1988, 62-190173
Int. Cl.[5] G05B *19/25*
U.S. Cl. 318—571 **20 Claims**



1. A numerical control apparatus for controlling a position of a feed shaft in relation to a rotational angle of a main shaft of a machine tool, said numerical control apparatus comprising:

first means for detecting an actual position of the feed shaft

and for outputting a first feed shaft position value according to the thus detecting actual position of the feed shaft;

second means for detecting a rotational position of the main shaft and for outputting a main shaft rotational position signal according to the thus detected rotational position of the main shaft;

third means, responsive to said main shaft rotational position signal output by said second means, for outputting a predetermined second feed shaft position value which correspond to a predetermined rotational position of the main shaft;

fourth means for subtracting one of said first and second feed shaft position values from the other of said first and second feed shaft position values, and for outputting a corresponding positional deviation value;

fifth means for adjusting said positional deviation value according to a correction value, and for outputting a corresponding corrected positional deviation value; and

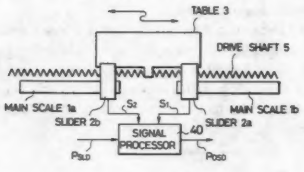
sixth means for controlling a position of the feed shaft according to said corrected positional deviation value.

4,983,900

LINEAR ENCODER WITH PLURAL DETECTORS FOR USE WITH ONE OR MORE MAIN SCALES

Masayuki Nashiki; Keiji Matsui, and Atushi Ieki, all of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Aug. 31, 1989, Ser. No. 401,057
Claims priority, application Japan, Aug. 31, 1988, 63-217238
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—652 **5 Claims**



1. A linear encoder comprising:

at least one main scale arranged so that its longitudinal axis is disposed along a straight line on which a mover runs;

a plurality of sliders situated in parallel with said straight line so as to move relative to said at least one main scale, said plurality of sliders reading information disposed on said at lest one main scale and outputting electrical signals corresponding to said information; and

a signal processor for determining and outputting position data of said mover according to said electrical signals output from said plurality of sliders, each of said electrical signals respectively containing slider position data indicating a position of its respective slider along a position detecting stroke;

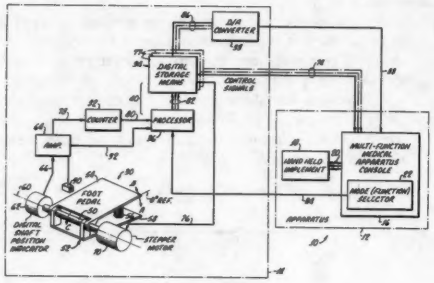
wherein said signal processor comprises: a usage unit judging portion for judging a combination of a slider selected from said plurality of sliders to be used and a main scale selected from said at least one main scale facing said slider on the basis of said slider position data and for providing a usage slider command in response thereto; a signal selector for selecting one electrical signal from said electrical signals output from said plurality of sliders according to said usage slider command output by said usage unit judging portion; a position processor for determining position-related data according to said electrical signal selected by said signal selector; a position offset memory portion for previously storing a position offset related to a combination of a slider selected from said plurality of sliders and a main scale selected from said at least one main scale and for outputting a position offset corresponding to each of said combinations of said selected slider and selected said main scale, respectively judged by said usage unit judging position; and an adder for adding data output from said position processor to said position offset output from said position offset memory portion in order to obtain and output said position data of said mover.

4,983,901

DIGITAL ELECTRONIC FOOT CONTROL FOR MEDICAL APPARATUS AND THE LIKE

Donald E. Lehmer, Berkeley, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Apr. 21, 1989, Ser. No. 342,254
Int. Cl.[5] G05B *19/40*
U.S. Cl. 318—685 **25 Claims**



1. A digital electronic foot pedal control system for controlling the operation of an associated apparatus, said foot pedal control system comprising:

a. foot pedal means including a pedal mount, a pedal shaft pivotally mounted to said mount, and a foot-operated pedal fixed to said shaft to pivot therewith;

b. digital shaft rotational position indicating means connected to said shaft for providing digital shaft position output signals indicative of pedal rotational positions relative to a pedal zero reference position; and

c. logic means which include:

(1) digital storage means for storing N given sets of shaft position output control signals which correspond to N given pedal positions, and

(3) processing means connected for receiving said shaft position output signals from said shaft rotational position indicating means and responsive thereto for causing the outputting from said storage means of corresponding ones of said sets of control signals for controlling the operation of said associated apparatus.

4,983,902

FAST CURRENT DISCHARGING SWITCH FOR A VARIABLE RELUCTANCE MOTOR DRIVE

Rasappa Palaniappan, Michigan City, Ind., and John J. Dhyanchand, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 1, 1989, Ser. No. 430,244
Int. Cl.[5] H02P *7/40*
U.S. Cl. 318—701 **25 Claims**

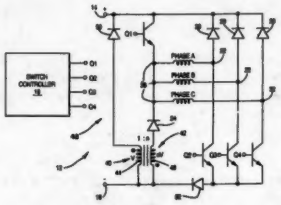
17. In a circuit for stopping current flow in each phase winding of a variable reluctance motor to produce rotation of a rotor, the improvement comprising:

a pair of semiconductor switches respectively connected between different terminals of each phase winding, and first and second potentials of a power supply, each pair of switches disconnecting the phase winding from the power supply; and

means, in response to signals being applied to each pair of switches by a controller to cause each pair of switches to

turn off, for generating a potential applied to the phase winding connected to the switches being turned off to oppose a potential induced in the phase winding connected to the pair of switches being turned off to accelerate stopping current flow in the winding connected to the pair of switches being turned off.

25. A method for stopping current flow in each phase winding of a variable reluctance motor in which the current flow through each phase winding is controlled by controlling conductivity of first and second switches respectively connectable



to first and second reference potentials of a power supply and to different terminals of each phase winding to produce rotation of a rotor comprising:

generating control signals for causing the first and second switches to stop the current flow in each phase winding; and

in response to a potential induced in each phase winding by initiating turning off of the switches, generating a potential applied to each phase winding to oppose the induced potential to accelerate stopping current flow in the phase winding connected to the switches being turned off.

4,983,903

AUTOMATIC BATTERY EXCHANGING SYSTEM FOR AUTOMATIC GUIDED VEHICLES

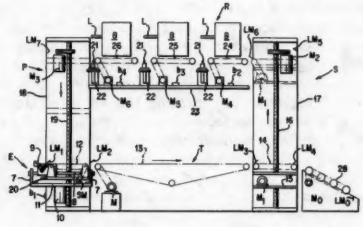
Kisun Bae, and Yunghoon Joo, both of Suwon Kyungki, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jul. 13, 1989, Ser. No. 379,046

Claims priority, application Rep. of Korea, Jul. 13, 1988, 88-8716

Int. Cl.[5] B65G *67/00*; H22J *7/00*

U.S. Cl. 320—2 **4 Claims**



1. A computer-controlled automatic battery exchanging system for exchanging a discharged battery of an automatic guided vehicle with a charged battery, which automatic battery charging system comprises;

first means for dismounting the discharged battery from the automated guided vehicle and mounting the charged battery in the automated guided vehicle, said first means comprising a hook and a rodless cylinder, said hook being mounted to and movable with said rodless cylinder, and means for raising and lowering said rodless cylinder;

second means, associated with said first means, for charging the discharged battery;

third means for transferring the charged battery to said first means for mounting in the automated guided vehicle; and

a control unit for controlling the execution of said first means, said second means, and said third means.

4,983,904

BATTERY CHARGER FOR VEHICLE-MOUNTED EQUIPMENT USING ENGINE OPERATION AS START TIMING DETERMINATION

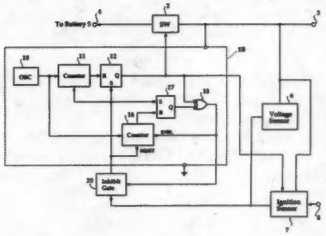
Koji Iwahashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 21, 1989, Ser. No. 410,718

Claims priority, application Japan, Sep. 26, 1988, 63-241485

Int. Cl.[5] H02J *7/00, 7/14*

U.S. Cl. 320—15 **7 Claims**



1. A battery charger for an equipment adapted to be mounted on a motor vehicle for charging a rechargeable battery of said equipment, said motor vehicle having DC generator means driven by the engine of the vehicle and an vehicle battery charged by said DC generator, comprising:

first sensor means for detecting when voltage of said vehicle battery is higher than a specified level;

second sensor means for detecting when said engine is running;

switch means connected between said vehicle battery and said rechargeable battery; and

timing means responsive to output signals from said first and second sensor means for causing said switch means to establish a path between said batteries for an interval sufficient to charge said rechargeable battery with a current supplied from the vehicle battery.

4,983,905

CONSTANT VOLTAGE SOURCE CIRCUIT

Yoshiaki Sano, Yokohama; Toshio Hanazawa; Yasuhide Katagase, both of Kasugai; Katsuyuki Yasukouchi, Seto; Takashi Matsumoto, Inazawa, all of Japan, and Susumu Fujihara, Torrance, Calif., assignors to Fujitsu Limited, Kawasaki; Fujitsu VLSI Limited, Kasugai and Fujitsu Ten Limited, Kobe, all of, Japan

Filed Jul. 5, 1989, Ser. No. 375,707

Claims priority, application Japan, Jul. 5, 1988, 63-167939; Jul. 5, 1988, 63-167940

Int. Cl.[5] G05F *1/56*

U.S. Cl. 323—274 **15 Claims**

1. A constant voltage source circuit comprising:

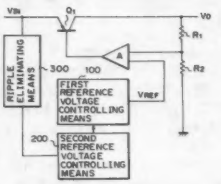
an input terminal for receiving an input voltage;

an output transistor connected to said input terminal for outputting a predetermined output voltage in accordance with said input voltage;

a differential amplifier for controlling said output transistor; and

a reference voltage control means, operatively connected to said differential amplifier and said input terminal, for

monitoring variations of said input voltage and for outputting a predetermined constant voltage to said differential amplifier as a reference voltage when said input voltage is higher than a predetermined voltage level, and outputting



a voltage varied in accordance with the variation of said input voltage to said differential amplifier as the reference voltage when said input voltage falls below said predetermined voltage level.

4,983,906

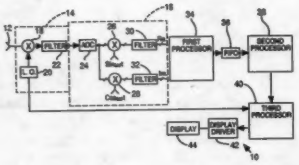
FREQUENCY ESTIMATION SYSTEM

Donald R. Hiller, Lake Stevens, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 17, 1989, Ser. No. 395,226

Int. Cl.[5] G01R *23/14*

U.S. Cl. 324—79 D **11 Claims**



1. An electronic measurement instrument comprising:

input means for receiving an analog waveform;

signal processing means for converting said analog waveform into digital data sequences corresponding to real and imaginary components of the waveform at a number of points therealong;

means for determining from said real and imaginary data sequences a phase datum at a number of points along the analog signal; and

means for performing a linear regression fit on said number of phase data to determine a best estimate of the phase rate of change of the analog waveform;

wherein the phase datum is a cumulative phase of the analog signal waveform.

4,983,907

DRIVEN GUARD PROBE CARD

Richard N. Crowley, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 50,223, May 14, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 323,121

Int. Cl.[5] G01R *1/073*

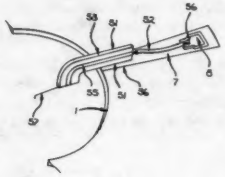
U.S. Cl. 324—158 P **13 Claims**

1. In the testing of integrated circuits where a probe card is used to provide electrical coupling between the integrated circuit and test equipment and where the test equipment provides a plurality of signals for driving shields, an improvement comprising:

a plurality of electrically separate shields on the probe card;

wherein each of said shields surrounds a pad on the top side of the probe card;

each of said pads being for providing electrical coupling between a probe and the test equipment;



the test equipment electrically coupled with said shields for driving each of said shields to the same electrical potential as an associated one of said signals received by said test equipment.

4,983,908

PROBING CARD FOR WAFER TESTING AND METHOD OF MANUFACTURING THE SAME

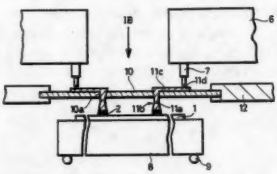
Tetsuo Tada, and Ryouichi Takagi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,463

Claims priority, application Japan, Oct. 11, 1989, 1-264150

Int. Cl.[5] G01R *1/06, 31/07*

U.S. Cl. 324—158 P **8 Claims**



1. A probing card for wafer testing having a plurality of probes arranged so as to correspond to and come in contact with a plurality of bonding pads of semiconductor devices fabricated on a semiconductor wafer, comprising:

a base plate having two main surfaces and formed of a material having electrically insulating, transparent and photosensitive properties, said base plate defining through holes extending from one of said main surfaces to the other;

contact fingers formed of a conductive material as columnar elements extending through and filling said through holes and having a cross-sectional area decreasing from opposite ends to an intermediate position thereof, each of said contact fingers having one end thereof projecting from one of said main surfaces of said base plate, at least said one end defining a substantially planar end face; and

conductive wiring layers formed in a predetermined pattern on the other main surface of said base plate and connected respectively to the other ends of said contact fingers.

4,983,909

REPETITIVE-SWITCHING

Mark A. Swart, Upland, and Charles J. Johnston, Walnut, both of Calif., assignors to Everett/Charles Contact Products, Inc., Pomona, Calif.

Filed Nov. 28, 1989, Ser. No. 442,289

Int. Cl.[5] G01R *1/06*

U.S. Cl. 324—158 P **6 Claims**

1. A repetitive-switching switch probe comprising:

an outer barrel;

a movable plunger in one end portion of the barrel;

a terminal projecting from an opposite end of the barrel;

means for retaining the plunger in an at-rest position spaced from a switch point on the terminal so that absence of contact between the plunger and the switch point produces an electrical open circuit condition in an electrical test circuit connected to the switch probe; and

a repetitive-switching clip on the barrel and normally engaging a contact surface on the plunger for retaining the plunger in its at-rest position, substantially immovable in the barrel and out of contact with the switch point on the terminal;

the repetitive-switching clip retaining the plunger in its at-rest position by a resistance force of a preset threshold level applied to the plunger contact surface by the clip, so

that an external test force of less than said threshold level applied to the plunger in opposition to the resistance force applied by the breakaway clip will not move the plunger from its at-rest position;

the repetitive-switching clip being movable away from its engagement with the contact surface of the plunger when said external test force applied to the plunger exceeds said threshold level, said movement of the repetitive-switching clip away from the plunger contact surface allowing the plunger to travel in the barrel toward and into contact with the switch point on the terminal to produce a closed circuit condition in the electrical test circuit connected to the switch probe.

4,983,910

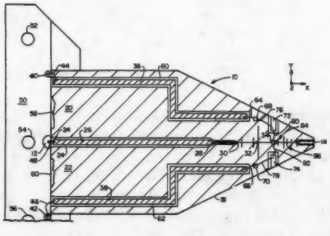
MILLIMETER-WAVE ACTIVE PROBE

Gholamreza Majidi-Ahy, Sunnyvale, and David M. Bloom, Portola Valley, both of Calif., assignors to Stanford University, Stanford, Calif.

Filed May 20, 1988, Ser. No. 196,998

Int. Cl.[5] G01R *1/06, 1/067*

U.S. Cl. 324—158 P **12 Claims**



1. An apparatus having a tapered substrate and a coaxial input and a co-planar waveguide output for generating millimeter-wavelength frequencies comprising:

a low pass filter having an input for receiving an input signal at a first frequency and having an output and having a selected characteristic input and output impedance at said first frequency selected to match the output impedance of any source coupled to said coaxial input;

at least one non-linear element, such as one pair of diodes coupled together in an antiparallel network, acting as a harmonic generator and having first and second ports, said second port being coupled to a reference potential such as ground potential;

an input impedance matching network having an input coupled to said output of said low pass filter and having an output coupled to said first port of said diode network and having an input impedance at said first frequency which substantially matches the output impedance of said low pass filter and having an output impedance which substantially matches the input impedance of said diodes at said first frequency and which causes reflection of a desired harmonic toward said output and which suppresses the generation of at least some other harmonics having frequencies above and below the frequency of said desired harmonic;

an output impedance matching network having an input port coupled to said first port of said diode network and having an output port and having an impedance at said input port which substantially matches the output impedance of said diodes at the frequency of said desired harmonic and which is high enough at said first frequency to reflect energy at said first frequency toward said input and which is low enough at the frequency of one or more other harmonics to substantially suppress the generation thereof and having said characteristic impedance at said output port at the frequency of said desired harmonic; and

a bandpass filter having an input port coupled to the output port of said output matching network, and having an output port coupled to said co-planar waveguide output, and having said characteristic impedance at said input port and said output port at the frequency of said desired harmonic.

4,983,911

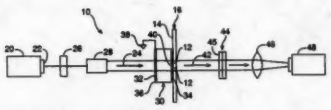
VOLTAGE IMAGING SYSTEM USING ELECTRO-OPTICS

Francois J. Henley, Los Gatos, Calif., assignor to Photon Dynamics, Inc., San Jose, Calif.

Filed Feb. 15, 1990, Ser. No. 481,429

Int. Cl.[5] G01R *31/28;* **G01J** *4/00*

U.S. Cl. 324—158 R **20 Claims**



17. An apparatus for simultaneously observing voltage at a plurality of positions on a surface of a panel under test comprising:

a light source for producing optical energy;

a polarizing element for polarizing said optical energy in a source beam to a known polarization state;

a lens system for expanding and collimating said source beam into an input beam of known polarization state;

an electro-optic modulator means, said electro-optic modulator means having a first face and an opposing second face in an orientation to allow longitudinal probing geometries, said first face having a conductive coating electrically coupled to a voltage common and said second face being disposed to be adjacent an area of said surface of

said panel under test, said modulator means being oriented to intercept at least a portion of said input beam directed into said modulator means through said first face to impinge on said second face adjacent said area of said surface in order to cause in an output beam spatially-dependent change in polarization along said input beam, said change in polarization being proportional to voltages at positions on said surface;

means disposed in the path of said output beam for analyzing energy of said output beam in proportion to spatially-dependent elliptical polarization of said energy in order to impose a spatially-dependent power modulation proportional to voltage at corresponding positions of said surface; and

means disposed to intercept said spatially-dependent power modulation for producing an observable map having features corresponding to voltage magnitude to analyze voltages on said surface.

4,983,912

METHOD FOR CALIBRATING SQUID GRADIOMETERS OF AN ARBITRARY ORDER

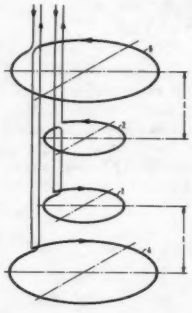
Gerhard Roehrlein, Hoechstadt, and Heinrich Seifert, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 26, 1990, Ser. No. 498,617

Claims priority, application European Pat. Off., Mar. 29, 1989, 89105569

Int. Cl.[5] G01R *35/00*

U.S. Cl. 324—202 **6 Claims**



1. A method for calibrating a SQUID gradiometer of an arbitrary order, said method comprising the steps of:

providing an nth-order gradiometer associated with a respective SQUID, said nth-order gradiometer having gradiometer coils;

providing a plurality of calibration coils;

commonly penetrating each of said gradiometer coils by magnetic fields respectively generated by each of two calibration coils of said plurality of calibration coils, each of said two calibration coils generating opposing magnetic fields so as to produce a magnetic field across said gradiometer coils having a net uniform magnetic field component as well as gradient magnetic field components up to and including gradient magnetic field components of an (n−1)th order which are negligible.

4,983,913

METHOD AND APPARATUS FOR MEASURING A GAS BY EXPLOITING THE PARAMAGNETIC PROPERTIES OF THE GAS

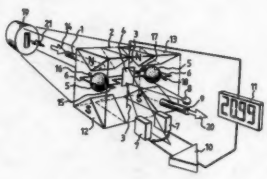
Hans Krause, Bad Nauheim; Rudi Roess, Bruchkoebel, and Ulrich Modlinski, Alzenau-Albstadt, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 23, 1990, Ser. No. 497,929

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1989, 3940036

Int. Cl.[5] G01N *31/00, 27/74;* G01R *33/12*

U.S. Cl. 324—204 **15 Claims**



1. A paramagnetic gas measuring device including diamagnetic members, and an infrared radiator operatively positioned to irradiate the members so as to desorb moisture adsorbed thereon.

4,983,914

PROXIMITY MEASUREMENT BY INDUCTIVE SENSING USING SINGLE TURN UHF ENERGIZED COIL SENSORS INCORPORATED INTO CUTTER HEAD OF SHEEP SHEARING DEVICE

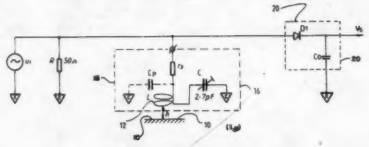
Jan Baranski, Perth, Australia, assignor to The University of Western Australia, Nedlands, Australia

Continuation of Ser. No. 102,204, Sep. 29, 1987, abandoned. This application Mar. 28, 1990, Ser. No. 500,100

Claims priority, application Australia, Sep. 29, 1986, PH8260

Int. Cl.[5] G01B *7/14;* B26D *5/00*

U.S. Cl. 324—207.16 **17 Claims**



1. Apparatus for measuring the proximity of an object to a surface of low conductivity material, comprising at least one sensor located on said object, said sensor including a single turn coil connected in a tuned circuit, the inductance of said coil varying in accordance with changes in said proximity, and RF means coupled to said tuned circuit for applying a UHF RF signal in the vicinity of 830 MHz to said tuned circuit, and for detecting at the output of said tuned circuit a voltage amplitude representing said proximity.

4,983,915

DEVICE FOR DETERMINING THE ROTARY ANGLE POSITION OF ROTARY DRIVES OF ELECTRICAL MACHINES BY EVALUATION OF ELECTRICAL VOLTAGES BY SENSORS RESPONDING TO ROTARY MOVEMENTS

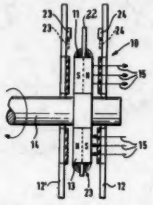
Lothar Rossi, In den Steinen 12, D-7302 Ostfildern 2, Fed. Rep. of Germany

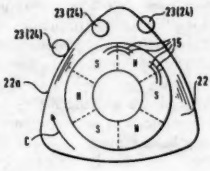
Filed Apr. 15, 1988, Ser. No. 181,927

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1987, 3713304

Int. Cl.[5] G01B *7/30;* **G01P** *3/488;* **H01F** *5/00*

U.S. Cl. 324—207.17 **24 Claims**





1. A device for determining the rotary-angle position of rotary drives of electrical machines whereby electrical voltages are generated and evaluated by sensors responding to the rotary movements comprising:

a plurality of at least three adjacent pairs of oppositely disposed transmitter and receiver heads, each said pair forming an inductive sensor arrangement and arranged in coaxial alignment;

a cam disk concentrically mounted with respect to the rotary drives and rotatably disposed between said transmitter and receiver heads, said cam disk having a curved shape configured so at a given position it simultaneously fully screens at least a first pair of said transmitter and receiver heads from each other, partially screens at least a second pair of said transmitter and receiver heads from each other, and fully exposes at least a third pair of said transmitter and receiver heads.

4,983,916

COMPACT MAGNETIC ENCODER

Kenzaburou Iijima; Yoshinori Hayashi, and Seiya Nishimura, all of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Jan. 25, 1989, Ser. No. 301,815

Claims priority, application Japan, Jan. 26, 1988, 63-14981; Jan. 26, 1988, 63-14982

Int. Cl.[5] G01B *7/14;* **G01N** *27/72;* **G01R** *33/12*

U.S. Cl. 324—207.21 **2 Claims**

1. An improved magnetic encoder, comprising:

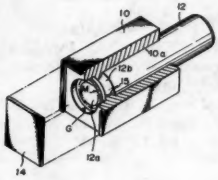
a housing having an axial through-hole;

a magnetic rotary spindle rotatably supported in said axial through-hole of said housing and provided with a magnetized pattern formed circularly on its one longitudinal end face along the periphery; and

a magnetic sensor attached to said housing and facing said magnetized pattern on said one longitudinal end face of said rotary spindle with a prescribed clearance;

said magnetized pattern being formed by use of a sine wave of a wavelength λ and having a constant pitch equal to said wavelength λ;

said magnetic sensor being made up of first and second magnetic resistor elements which (i) vary in inherent resistance depending on the intensity of an applied magnetic field and which (ii) are electrically separated from each other by an insulating layer;



each said first magnetic resistor element being phased from an adjacent second magnetic resistor element by a distance equal to $\lambda/4$; and

said first and second magnetic resistor elements being arranged in a circular disposition just corresponding to the circular arrangement of said magnetized pattern on said one longitudinal face of said rotary spindle; being circularly arranged side-by-side, each forming a hemicircle; and being concentrically arranged without superposition.

4,983,917

METHOD FOR MEASURING FLOWS IN A NUCLEAR MAGNETIC RESONANCE EXPERIMENT

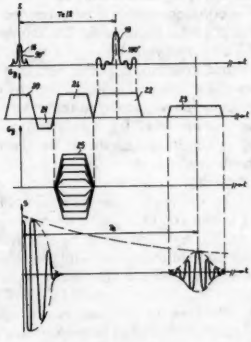
Patrick Le Roux, Gyf sur Yvette, France, assignor to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 192,526, May 11, 1988, Pat. No. 4,922,202. This application Nov. 8, 1989, Ser. No. 433,598

Claims priority, application France, May 12, 1987, 87 06650

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—306 **6 Claims**



1. A method of imaging flows in an NMR procedure, wherein:

a body to be examined, comprising parts in motion, is subjected to an orienting magnetic field,

a first set of parallel slices of this body are simultaneously

excited selectively so as to flip the orientation of magnetic moments of the parts of said body located in slices of said first set,

a resonance signal resulting from this flipping excitation is received, and

said resonance signal is processed in order to extract an imager indicative of flow of the parts in motion, said image being in a plane orthogonal to said first set of slices,

the method comprising, after said flipping excitation but before said reception, subjecting the body to one spin echo excitation, the effect of which is simultaneously limited in space to a second set of each slice of the second set being adjacent, on either side, to a slice of the first set.

4,983,918

MAGNETIC RESONANCE IMAGING SYSTEM

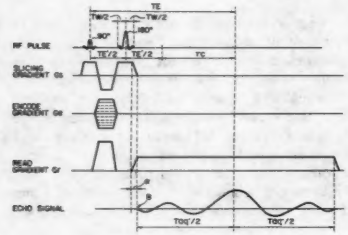
Kazuto Nakabayashi, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1989, Ser. No. 399,930

Claims priority, application Japan, Aug. 31, 1988, 63-214920

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **8 Claims**



1. A magnetic resonance imaging system comprising:

static magnetic field generating means for generating a sufficiently homogeneous static magnetic field in a predetermined imaging volume in which an object to be examined is placed;

gradient magnetic field applying means for applying a gradient magnetic field to the imaging volume;

RF pulse applying means for applying an RF pulse to the imaging volume;

sequence control means for controlling said gradient magnetic field applying means and said RF pulse applying means in accordance with a predetermined sequence so as to cause said gradient magnetic field applying means and said RF pulse applying means to respectively apply a predetermined gradient magnetic field and 90°–180° series RF pulses to the imaging volume, thereby causing a magnetic resonance phenomenon in the imaging volume;

receiving means for receiving a magnetic resonance signal generated in the imaging volume by the magnetic resonance phenomenon; and

imaging processing means for obtaining a magnetic resonance image by performing predetermined processing including image reconstruction processing for the magnetic resonance signal received by said receiving means,

said sequence control means including means for generating a 180° pulse at a timing at which a peak of the 180° pulse appears at t=TE'/2, assuming that $TE'=TE-n\tau c$ (where TE is the echo time for a proton, τc is the period in which phases of spins of water and fat match with each other and which is obtained on the basis of a chemical shift amount of protons of water and fat, and n is an integer not less than 1), and a peak of a 90° pulse appears at t=0, means for generating a read gradient magnetic field Gr whose strength condition is set to cause an echo peak to appear at $t=TE=TE'+n\tau c$, and means for generating a second 180° pulse at $T\pi 2$ for an echo time TE2' for a second MR echo signal

$$T\pi 2=(TE2'-TE1)/2.$$

4,983,919

FREQUENCY RESPONSE DETECTION APPARATUS

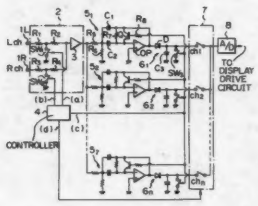
Hideki Fujimoto, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,768

Claims priority, application Japan, Oct. 31, 1988, 63-142275

Int. Cl.[5] G01R *23/16*

U.S. Cl. 324—77 E **2 Claims**



1. A frequency response detection apparatus comprising:

an input means for alternately introducing audio signals from left and right channels at a predetermined periodic interval of a predetermined duration interposed between signal introduction periods;

a plurality of frequency analyzing means for dividing said audio signals introduced by said input means into a plurality of frequency band signals;

detector means for respectively detecting each of said plurality of frequency band signals;

reset means for grounding an output end of said detector means in said intervals of said predetermined duration; and

relay switch means for relaying in turn each of the detected output signals of said frequency band signals;

wherein said frequency analyzing means includes a plurality of band-pass filters corresponding to said plurality of frequency band signals and a control means for making the gain of one of band-pass filters substantially equal to zero in synchronism with reset timings of said reset means.

4,983,920

NMR SPECTROSCOPY WITH PHASE ENCODING WITHIN A SELECTED VOXEL

David A. Lampman, Lakewood; Martyn N. J. Paley, Mayfield Village, and James M. McNally, Chagrin Falls, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Aug. 11, 1989, Ser. No. 392,480

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **20 Claims**

1. A method of magnetic resonance spectroscopy comprising:

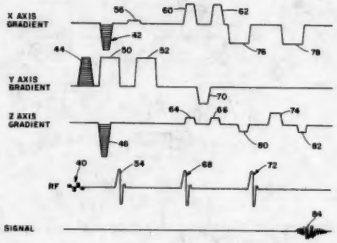
selectively exciting resonance of selected dipoles within an examination region;

applying a series of concurrent radio frequency refocusing pulses and slice select pulses, the slice select pulses being applied along a plurality of axes, such that each concurrent refocusing pulse and slice select gradient pulse manipulate resonance within a corresponding slice, such that resonance of dipoles within a voxel defined by an intersection of the slices contribute to a resultant spin echo substantially to the exclusion of nuclei outside of the voxel;

applying a phase encode gradient along at least one gradient

axis, such that the defined voxel is phase encoded into subvoxels along such axis;

segregating data from the resultant spin echoes in accordance with the phase encoding such that echo data corresponding to each subvoxel is separated;



spectrally analyzing data from individual subvoxel;

concurrently displaying spectral analysis data from a plurality of the subvoxels.

4,983,921

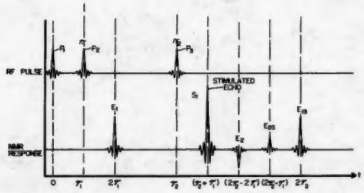
RAPID CALIBRATION OF NUTATION ANGLES IN MRI

David M. Kramer, San Rafael, and Joseph W. Carlson, Kensington, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 18, 1989, Ser. No. 395,841

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **19 Claims**



1. Apparatus for rapidly and accurately calibrating RF transmit parameters of a magnetic resonance imaging (MRI) including:

processing means connected to receive intensity values corresponding to plural NMR spin-echo responses for calculating a ratio of said intensity values that is substantially independent of T_1 and T_2 relaxation times and for estimating flip angle in response to said calculated ratio; and

control means for generating RF transmit parameter control signals in response to said estimated flip angle.

4,983,922

MAGNETIC SHIM FOR MAGNETIC FIELD CORRECTION

Yasuyuki Tahara, Ako, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,692

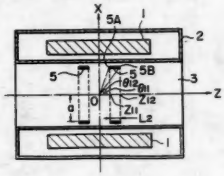
Claims priority, application Japan, Jun. 3, 1988, 63-135545

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—320 **3 Claims**

1. A magnetic field correcting magnetic shim for a superconducting magnet apparatus having a superconducting main coil for generating a uniform magnetic field in the vicinity of a central region thereof, a cryostat containing said superconducting main coil therein, and a magnetic field correcting apparatus having a magnetic field correcting shim disposed on a cylindrical surface substantially concentric to said main coil, characterized by:

said magnetic field correcting magnetic shim having two axially spaced end surfaces oriented perpendicular to an axial direction of the coil, a magnetic field generated by a magnetic charge appearing on said end surfaces having a



component contributing to an nth-power term of a spherical harmonization function development representing the magnetic field in the axial direction of the coil, and

the position of said two end surfaces being selected such that a component contributing to an (n+2)-power term generated by the magnetic charge on each of said end surfaces is non-zero, but the sum of the components contributing to the (n+2)-power term generated by the magnetic charge on said two end surfaces is zero.

4,983,923

FRICTIONAL ELECTROSTATIC VOLTAGE MEASURING EQUIPMENT

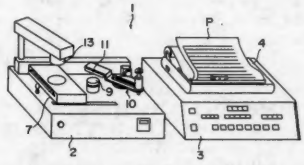
Motoji Taniguchi, Osaka, Japan, assignor to Kanebo Ltd., Tokyo and Kanebo Engineering Ltd., Osaka, both of, Japan

Filed Jul. 10, 1989, Ser. No. 377,607

Claims priority, application Japan, Jul. 13, 1988, 63-175995

Int. Cl.[5] G01N *27/60*

U.S. Cl. 324—454 **7 Claims**



1. Frictional electrostatic voltage measuring equipment comprising:

a body base;

a sample table installed on said body base so as to be reciprocally moveable between a measuring position and a rubbing position, said sample table having a top plate with a hole for exposing said sample and a sample plate holding unit for holding the sample plate by resiliently urging the plate against the back of said top plate;

a sample plate detachably inserted into said sample table for holding a sheet-form sample in stretched condition;

a pedestal at said rubbing position of said body base for supporting said sample from its back;

a rubbing unit comprising a rubbing pad and a driving unit for rubbing the surface of said sample supported by said pedestal;

an electrostatic voltage sensor provided at said measuring position for detecting the electrostatic voltage of the sample having been rubbed; and

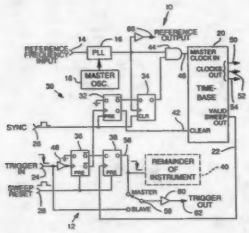
a data processor for processing the signal from said electrostatic voltage sensor.

4,983,924

METHOD AND APPARATUS FOR SYNCHRONIZED SWEEPING OF MULTIPLE INSTRUMENTS

Timothy L. Hillstrom, Everett, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 16, 1989, Ser. No. 367,160
Int. Cl.[5] H03K *17/00, 7/00*
U.S. Cl. 328—72 **12 Claims**



1. A trigger circuit for a swept instrument that permits swept operations to start only at certain phase conditions of an internal instrument clocking signal, the trigger circuit comprising:

trigger input means for receiving an input trigger signal;

reference clock input means for receiving a reference clock frequency signal;

timebase means coupled to the reference clock input means for dividing said reference clock to produce the instrument clocking signal, said instrument clocking signal having a frequency lower than the reference frequency;

reset means responsive to an externally applied timebase reset signal for causing the timebase means to start producing the instrument clocking signal beginning at a known phase state; and

means responsive to the input trigger signal for providing an internal triggering signal to other circuitry in the instrument to initiate its swept operation at the next of said certain phase conditions.

4,983,925

SIGNAL SAMPLING DEVICE FOR MINIMIZING THE ERRORS EFFECTING SUCCESSIVELY STORED SIGNAL SAMPLES

Claude Beauducel, Henonville, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 2, 1988, Ser. No. 279,080
Claims priority, application France, Dec. 2, 1987, 87 16848
Int. Cl.[5] H03K *5/00, 5/159;* G06G *7/16, 7/00*
U.S. Cl. 328—151 **4 Claims**

1. An improved device for sampling an input signal with a reduced error rate, said device comprising:

a first sampling element having a determined acquisition time for sampling the device input signal;

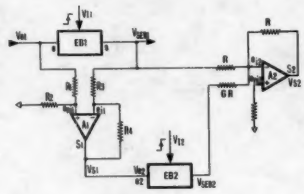
a second sampling element having the determined acquisition time;

means for applying a first control signal to said first sampling element to cause said first sampling element to have alternately a first sampling period and a first holding period;

means for applying a second control signal to said second sampling element to cause said second sampling element to have alternately a second sampling period and a second holding period, the second sampling period extending beyond the first sampling period by a time interval greater than the determined acquisition time;

amplifying means for amplifying the difference between the device input signal and the output signal of said first sampling element;

means connecting the output of said amplifying means to the input of said second sampling element; and



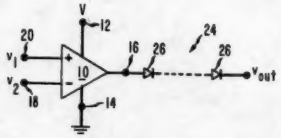
adding means for adding to the output signal of said first sampling element a fraction of the output signal of said second sampling element, thereby reducing errors applied to signal samples by said second sampling element.

4,983,926

NULL OFFSET VOLTAGE COMPENSATION FOR OPERATIONAL AMPLIFIERS

Lawrence R. Groehl, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1989, Ser. No. 393,610
Int. Cl.[5] H03F *1/14*
U.S. Cl. 330—51 **17 Claims**



1. In circuitry of the type having at least one operational amplifier which generates an offset voltage output when null output conditions exist at the inputs thereof, the improvement comprising:

means for blocking current flow from the output of each said operational amplifier unless the output voltage thereof exceeds the offset voltage output thereof when other than null output conditions exist at the inputs of that operational amplifier.

4,983,927

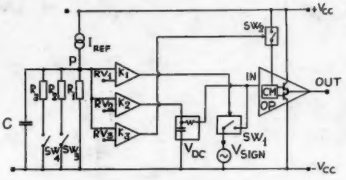
INTEGRATED AUDIO AMPLIFIER WITH COMBINED REGULATION OF THE "MUTE" AND "STANDBY" FUNCTIONS AND THE SWITCHING TRANSIENTS

Aldo Torazzina, Monza, Italy, assignor to SGS-Thomson Microelectronics SrL, Agrate Brianza, Italy

Filed Oct. 30, 1989, Ser. No. 428,516
Claims priority, application Italy, Nov. 9, 1988, 22556 A/88
Int. Cl.[5] H03F *3/30*
U.S. Cl. 330—51 **12 Claims**

11. An audio amplifier comprising an amplifier circuit which has at least one input terminal for connection via a first switch to a signal source and for connection to a biasing voltage generator of the type in which the voltage generated depends on the charge condition of a capacitor, and at least one output terminal for connection to a load and comprises an output stage connected between a first and a second terminal of a supply voltage generator, and biasing circuit means for the biasing of at least this output state, these means also being

connected between the first and second terminal of the supply voltage generator, the amplifier comprising a first, a second and a third threshold comparator, each having a first and a second input terminal and an output terminal, the first input terminal of each of these threshold comparators being connected to the first input terminal of the other threshold comparators in a common circuit node, designed to be a third control terminal, connected to the second terminal of the supply voltage generator via a capacitor, the second input terminal of the first threshold comparator, the second input terminal of the second threshold comparator and the second



input terminal of the third threshold comparator being connected to a first, a second and a third voltage reference, respectively, the output terminal of the first threshold comparator, the output terminal of the second threshold comparator and the output terminal of the third threshold comparator being respectively connected to the first switch, to the biasing voltage generator and to a second switch, connected in series with the biasing circuit means between the first and the second terminal of the supply voltage generator, these first and second switches and this biasing voltage generator being controlled by the first, the third and the second threshold comparator, respectively.

4,983,928

CONTROLLABLE AMPLIFIER CIRCUIT

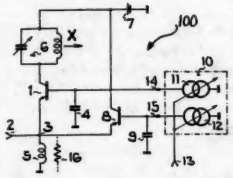
Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Fed. Rep. of Germany

Filed Mar. 20, 1989, Ser. No. 326,047

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811947

Int. Cl.[5] H03G *3/30*

U.S. Cl. 330—254 **28 Claims**



1. A controllable amplifier circuit, comprising:

an amplifier transistor receiving an input signal;

actuatable means for depriving said amplifier transistor of at least part of the input signal, said means for depriving including a further transistor connected between the emitter of said amplifier transistor and the supply voltage; said further transistor drawing part of said input signal from said amplifier transistor, for controlling amplification of said amplifier transistor and

a plurality of controllable current sources for driving the bases of said amplifier transistor and said further transistor, with control of said amplifier transistor and said further transistor being effected by controlling their respective base currents by feeding the total output currents of the respective said current sources to the respective bases of said amplifier transistor and said further transistor.

4,983,929

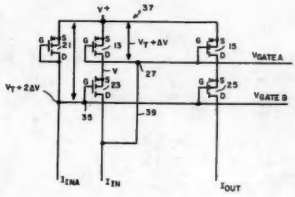
CASCODE CURRENT MIRROR

Peter Real, Groveland, and David H. Robertson, Somerville, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 27, 1989, Ser. No. 413,183

Int. Cl.[5] H03F *3/16*

U.S. Cl. 330—288 **28 Claims**



15. Apparatus for producing an output current that is a direct function of an input current received by that apparatus, comprising:

a first active semiconductor device including at least first, second and third terminals;

a second active semiconductor device including at least first, second and third terminals wherein said first terminal of said first device is operably connected to said first terminal of said second device and wherein said third terminal of said first device is operably connected to said third terminal of said second device;

a third active semiconductor device including at least first, second and third terminals wherein said first terminal of said third device is operably connected to said second terminal of said first device, and wherein said second terminal of said third device is operably connected to said third terminal of said first device and to said third terminal of said second device;

a fourth active semiconductor device including at least first, second and third terminals wherein said first terminal of said fourth device is operably connected to said second terminal of said second device, wherein said third terminal of said fourth device is operably connected to said third terminal of said third device;

a fifth active semiconductor device including at least first, second and third terminals wherein said first terminal of said fifth device is operably connected to said first terminal of each of said first and second devices, and wherein said second and third terminals of said fifth device are operably connected to said third terminal of each of said third and fourth devices;

whereby an input current applied to said second terminal of said third device results in production at said second terminal of said fourth device of a first output current that is a direct function of that input current.

4,983,930

CURRENT CONVEYOR

Douglas C. Wadsworth, Box 977, Manotick, Ontario, Canada (K0A 2N0)

Filed Dec. 15, 1989, Ser. No. 451,237

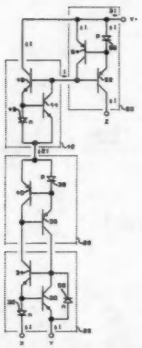
Claims priority, application Canada, Dec. 29, 1988, 587,317

Int. Cl.[5] H03F *3/04;* 330 *288;* 323 *315, 316*

U.S. Cl. 330—288 **15 Claims**

1. A current conveyor comprising an input port (X), a reference port (Y) and an output port (Z), a first current mirror (26) connected to said input port and said reference port and com-

prising bipolar transistors of one polarity type, a second current mirror (28) cross-coupled with said first current mirror and comprising bipolar transistors of the other polarity type, and means (42:50) for supplying current to said second current mirror and to said output port such that the current supplied to said output port is substantially proportional to the current supplied from said input port (X), said current supplying means comprising a third current mirror (42) and an output current mirror (50), the third current mirror comprising bipolar transistors of said one polarity type connected to supply current to said second current mirror (28), said output current mirror (50) comprising bipolar transistors of the other polarity type and having a source terminal connected to said output port and a sink terminal connected to a supply (V+), said third current mirror having a first terminal for receiving current from said supply (V+) and a second terminal for receiving current from said output current mirror (50), such that a current equal to the current provided at said second terminal is provided at the output port.



4,983,931

CR-TYPE OSCILLATOR CIRCUIT

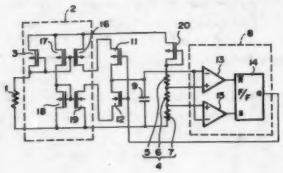
Masaji Nakano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 545,348

Claims priority, application Japan, Jun. 29, 1989, 1-169449

Int. Cl.[5] H03K *3/00*

U.S. Cl. 331—111 **6 Claims**



1. A CR-type oscillator circuit for generating triangular waves, said circuit comprising:

a reference resistor;

a current mirror circuit for taking out the current flowing in said reference resistor;

a reference capacitor whose charging and discharging is repeated within a predetermined potential changing range by the current taken out by said current mirror circuit;

a resistor divider network having a plurality of resistors connected in series for determining said potential changing range of the charging and discharging of said reference capacitor; and

a control circuit for maintaining at a constant value the ratio between said potential changing range of the charging and discharging of said reference capacitor and the potential differences developed across said reference resistor.

4,983,932

ELECTRIC NOISE ABSORBER

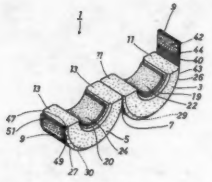
Hiroji Kitagawa, Nigoya, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Sep. 22, 1989, Ser. No. 411,005

Claims priority, application Japan, Sep. 26, 1988, 63-125302[U]

Int. Cl.[5] H03H *7/01*

U.S. Cl. 333—12 **16 Claims**



1. An electric noise absorber for absorbing noise on an electric cord, comprising:

two bodies of magnetic substance having inner and outer surfaces, where the bodies contact each other at first and second contact points such that they surround the cord;

a plastic film covering said outer surfaces of said two bodies;

a hinge attached to the first and second bodies, rotatably connecting the bodies at the first contact point; and

locking means attached to the first and second bodies for selectively interlocking the two bodies at the second contact point, wherein said locking means comprises a locking tab attached to a resilient member that extends from said first body at said second contact point and an engaging band attached to said second body at said contact point, where said resilient member resiliently extends and said locking tab selectively engages the engaging band, thereby securely holding the two bodies together.

4,983,933

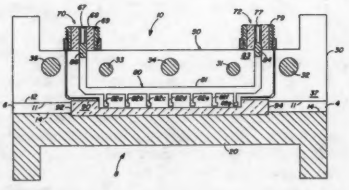
WAVEGUIDE-TO-STRIPLINE DIRECTIONAL COUPLER

Paul R. Volk, and Thomas R. Debski, both of Farmingdale, N.Y., assignors to Sedco Systems Inc., Long Island, N.Y.

Filed Oct. 5, 1989, Ser. No. 417,415

Int. Cl.[5] H01P *5/18*

U.S. Cl. 333—109 **9 Claims**



7. A directional coupler comprising:

(a) a section of waveguide having an inner cavity;

(b) means for coupling radio frequency (R.F.) energy between the section of waveguide and stripline circuitry, said coupling means including the stripline circuitry hav-

ing a plurality of probes disposed in the inner cavity and spaced at intervals of one-quarter wavelength of the R.F. energy; and

(c) means for providing a strip of dielectric material disposed in the inner cavity of the waveguide for maintaining a velocity of propagation of the R.F. energy in the waveguide approximately equal to a velocity of propagation of the R.F. energy in the stripline circuitry.

4,983,934

NOISE FILTER

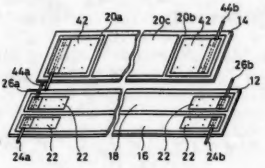
Mitsunao Okumura, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 19, 1989, Ser. No. 340,272

Claims priority, application Japan, Apr. 20, 1988, 63-98532; Oct. 3, 1988, 63-24959

Int. Cl.[5] H03H *7/01, 7/09*

U.S. Cl. 333—184 2 Claims



1. A noise filter, comprising:

a first elongated insulation sheet having a length which defines a longitudinal direction;

a plurality of first conductors formed on one surface of said first insulation sheet and extended thereon in said longitudinal direction, and spaced apart on said first insulation sheet so as to be insulated from each other;

a plurality of first terminals fixed on said first conductors in such a manner that at least two pairs of said terminals are fixed on respective different first conductors, end portions of said terminals extending away from said conductors in a width direction of said first insulation sheet;

a second elongated insulation sheet superposed on said first insulation sheet;

at least three second conductor elements formed on one surface of said second insulation sheet and extended in a longitudinal direction of said second insulation sheet, said second conductor elements including at least two end elements respectively disposed on said second insulation sheet on both sides of a middle element; and

at least a pair of second terminals fixed respectively to the end conductor elements at both ends of said second sheet, said middle conductor element having no second terminal fixed thereto; wherein

said first and second insulation sheets are wound together with said first conductor and second conductor elements so as to form a wound unit such that end portions of said first and second terminals extend from end surfaces of said wound unit;

inductances are respectively formed between a pair of the first terminals and between another pair of the first terminals by said first conductors;

a first distributed capacitance is formed between each of said first conductors and said second conductor elements, said distributed capacitance being connected in series between said first conductors via said second conductor elements; and

a second distributed capacitance is formed between each of said first terminals and said second terminals.

4,983,935

FIXING FRAME AND FILTER UNIT FOR CONNECTORS

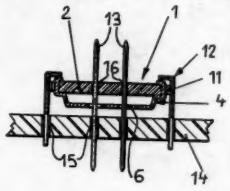
Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 12, 1989, Ser. No. 406,803

Claims priority, application Netherlands, Sep. 13, 1988, 8802249

Int. Cl.[5] H01R *13/658*

U.S. Cl. 333—184 12 Claims



1. A frame for fixing a filter unit within a connector having a shielding housing and plurality of contact terminals, the filter unit having a substrate with a pattern of apertures for receiving the contact terminals of the connector, the fixing frame comprising a metal base plate having a pattern of apertures corresponding to the pattern of apertures in the filter unit substrate, said base plate being provided at opposite side edges thereof with upright sides, each said upright side having a guide groove facing one another so as to accommodate between them the substrate in such a way that the patterns of apertures in the filter unit substrate and frame coincide, the fixing frame also being provided with spring-loaded contact elements for contacting the shielding housing of the connector.

4,983,936

FERROMAGNETIC RESONANCE DEVICE

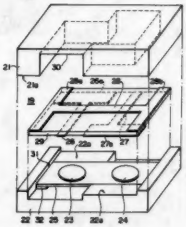
Yoshikazu Murakami; Takahiro Ogihara; Tsutomu Okamoto, and Kanako Niikura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 69,024, Jul. 1, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,391

Claims priority, application Japan, Jul. 2, 1986, 1-55624; Jul. 2, 1986, 1-55625; Jul. 2, 1986, 1-55626

Int. Cl.[5] H01P *1/215*

U.S. Cl. 333—202 14 Claims



1. A ferromagnetic resonance device comprising a YIG thin film element formed on a non-magnetic substrate, said YIG thin film element having a major surface coinciding with its (100) plane, a transmission line coupled to said YIG thin film element, and

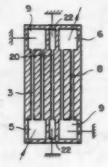
a bias magnetic field means applying a bias magnetic field perpendicular to said major surface.

4,983,937

MAGNETOSTATIC WAVE BAND-PASS-FILTER

Yasuaki Kinoshita, Hachioji; Sadami Kubota, and Shigeru Takeda, both of Kumagaya, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,483
Claims priority, application Japan, Jul. 20, 1988, 63-179046
Int. Cl.[5] H01P *1/217*
U.S. Cl. 333—202 8 Claims



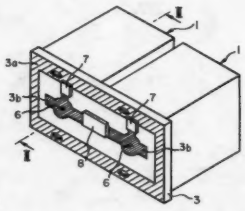
1. A magnetostatic wave band-pass-filter comprising:
a single crystal gadolinium gallium garnet substrate;
a single crystal thin film formed on said substrate and mainly containing yttrium iron garnet, said thin film having a pair of parallel edges;
an input electrode formed on said thin film and having at least one finger electrode parallel to the edges of said thin film and a pair of pad electrodes, said pad electrodes being formed at both ends of said finger electrode, one of said pad electrodes being grounded, a high-frequency input signal being applied to the other pad electrode, to excite a magnetostatic wave in said thin film, said magnetostatic wave being reflected from the edges of the thin film, to generate resonance;
an output electrode formed on said thin film and having at least one finger electrode parallel to the edges of said thin film and a pair of pad electrodes, said pad electrodes being formed at both ends of said finger electrode, one of said pad electrodes being grounded, and the other of said pad electrodes connected to take out a high-frequency output signal current excited by said magnetostatic wave;
magnetic field generating means for applying a bias magnetic field to said thin film; and
wherein the total number of said finger electrodes is three or more.

4,983,938

BAND-STOP FILTER

Kanemi Sasaki, Hamura, and Sadao Ogawa, Fussa, both of Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,785
Claims priority, application Japan, Nov. 21, 1988, 63-295542
Int. Cl.[5] H01P *1/202*
U.S. Cl. 333—207 4 Claims



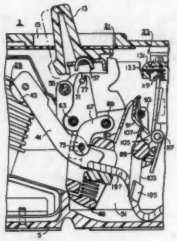
1. A band-stop filter comprising;
a plurality of resonator units, each of said plurality of resonator units having an end-shorted coaxial resonator and a variable frequency control means for adjusting frequencies connected in series;
printed circuit board means;
said plurality of resonator units being multi-stage connected by said printed circuit board means;
said printed circuit board means having thru-holes adjacent a bushing in each of said plurality of resonator units, said bushing isolating an inner conductor of each of said end-shorted coxial resonators from said printed circuit board means;
coil means on said printed circuit board means connecting each of said plurality of resonator units to ground;
a coupling capacitor on said printed circuit board means connecting adjacent pairs of said plurality of resonator units;
said thru-holes in said printed circuit board means being coated with a conductor; and
a frequency adjusting screw having a radius slightly larger than the hole formed by said conductive coating being threaded into said conductive coating.

4,983,939

CIRCUIT BREAKER WITH ADJUSTABLE LOW MAGNETIC TRIP

John J. Shea, Monroeville; Richard P. Sabol, Munhall; Louis Paich, Center Township; Ronald A. Cheski, Stowe Township; Kenneth W. Sanner, Ohioville, and William E. Beatty, Jr., Brighton Township, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1989, Ser. No. 417,360
Int. Cl.[5] H01H *75/10*
U.S. Cl. 335—42 15 Claims



1. A circuit breaker for responding to abnormal currents in a conductor in an electrical system, comprising:
electrical contacts operable between a closed position in which a circuit is completed through the conductor and an open position in which the circuit through the conductor is interrupted;
a latchable operating mechanism operable to open said electrical contacts when unlatched;
a magnetic trip assembly comprising:
a stationary magnetic structure in which a magnetic flux is produced by current in said conductor passing through said electrical contacts;
a movable armature which is attracted to the stationary magnetic structure by said magnetic flux produced by an abnormal current of a selected value through said electrical contacts to unlatch said latchable operating mechanism and open said electrical contacts;
spring means applying a spring biasing force to said armature to bias said armature away from said stationary magnetic structure to form a gap therewith; and
spring adjusting means movable over a range of travel adjusting said biasing force to modify the selected value of abnormal current at which said armature is attracted to the fixed magnetic structure to unlatch the latchable operating mechanism, said spring adjusting means providing a

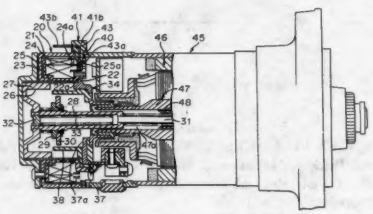
first relationship between a predetermined increment of movement of the spring adjusting means and change in said biasing force over a first portion of said range of travel of the spring adjusting means and providing a second relationship between said predetermined increment of movement of the spring adjusting means and change in said biasing force over a second portion of the range of travel of said spring adjusting means, said first and second relationship being different.

4,983,940

ELECTROMAGNETIC SWITCH

Keiichi Konishi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,346
Claims priority, application Japan, Apr. 13, 1989, 1-93719
Int. Cl.[5] H01H *67/02*
U.S. Cl. 335—126 **19 Claims**



1. An electromagnetic switch, comprising:
(a) an outer casing (**21**),
(b) a cylindrical bobbin (**25**) arranged in the outer casing proximate magnetic core means (**22,23**) and having an exciting coil (**24**) wound thereon,
(c) a plunger (**27**) arranged in an inner passage of the bobbin so as to be slidable under the action of magnetic attraction force,
(d) a rod (**28**) disposed to move in association with the plunger,
(e) a movable contact (**30**) carried on the rod, and adapted to engage a fixed contact (**37*a***) when the plunger moves in one direction, the fixed contact being arranged at a predetermined position,
(f) a U-shaped cutout (**39**) formed in an outer peripheral edge of the magnetic core means,
(g) a U-shaped lead-out member (**25*a***) projecting from one end of the bobbin in an axial direction, disposed in the cutout, and open in a radially outward direction,
(h) a mounting opening (**40**) formed in the outer casing and confronting the cutout, and
(i) an electrical terminal member (**41**) press-fitted into the mounting opening, and including an electrical terminal plate (**43**) extending radially inwardly through the mounting opening and into the lead-out member, and connected thereat to leads (**24*a***) of the exciting coil.

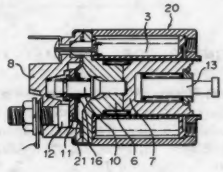
4,983,941

ELECTROMAGNETICALLY OPERATED SWITCH

Toshinori Tanaka, Hemeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,186
Claims priority, application Japan, Nov. 24, 1988, 63-152956
Int. Cl.[5] H01F *7/16, 7/08, 7/13*
U.S. Cl. 335—255 **6 Claims**

1. An electromagnetically operated switch comprising:
a cylindrical bobbin having an exciting coil would thereon;
a fixed core arranged in the bobbin and a movable core arranged to confront the fixed core;
a flange provided on the fixed core to expand outwardly in the radial direction and located on an end surface of the bobbin;
a rod inserted in a through bore formed in the center of the fixed core;
a flexibly insulating sheet put on the end surface of the flange of the fixed core, having an opening in a central portion,



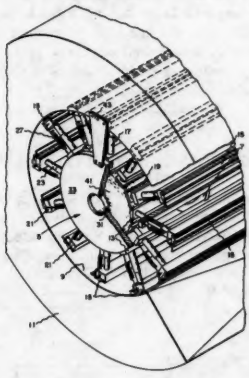
and connected sealingly to the rod which extends through the opening, wherein said sheet is provided with an air bleed aperture;
a cup-shaped cap mounted on the flange end surface to sandwich the sheet between the flange and the cap; and
a movable contact supported by the rod in the cap.

4,983,942

APPARATUS FOR LOCATING PASSIVE SHIM GUIDE RAILS IN MR MAGNETS

Jay F. Benesch, Gaithersburg, Md., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,260
Int. Cl.[5] H01F *7/00*
U.S. Cl. 335—301 **4 Claims**



1. Apparatus for installing shim guide rails in an MR magnet comprising:
a plurality of beam members, one for every guide rail to be installed;
a plurality of coaxial ring shaped members spaced apart from one another, said beam members extending axially and spaced circumferentially about the outer diameter of said ring shaped members forming a cylindrical open ended cage, each of said beam members defining a plurality of radially extending spaced apart apertures;
a plurality of ladder-like structures, each of said ladder-like structures associated with a respective one of said beam members, said ladder-like structures each including two side pieces joined by a plurality of rungs extending therebetween, said rungs passing through the holes in said beam members with one of said side pieces situated inside the cylindrical cage and the other situated outside said cage,

said guide rails detachably mounted to a respective one of said side pieces outside said cage, the side of said guide rail to be mounted to the magnet bore facing radially outwardly; and

means for extending said rungs radially outwardly through the holes in said beam members so that said guide rails are forced against said magnet bore.

4,983,943

MAGNETIC CORE AND METHOD OF MANUFACTURING SAME

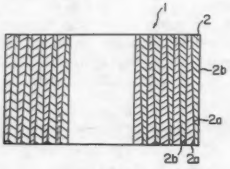
Shinichi Murata; Yoshiyuki Yamauchi; Takao Kusaka; Takao Sawa, and Noriaki Yagi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1989, Ser. No. 429,067

Claims priority, application Japan, Nov. 2, 1988, 63-278388

Int. Cl.[5] H01F *27/24*

U.S. Cl. 336—213 **8 Claims**



1. A magnetic core having a wound-up laminated body of at least two thin magnetic tapes, said magnetic tapes wound together in contacting relationship along the length thereof, each of said magnetic tapes having a thickness which varies across its width, the thickness of contacting adjacent tapes varying oppositely across their widths so that the thickness of the wound-up laminated body at the two ends in the width direction is substantially equal.

4,983,944

ORGANIC POSITIVE TEMPERATURE COEFFICIENT THERMISTOR

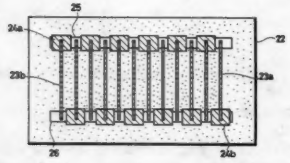
Katsuyuki Uchida, and Haruo Takahata, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 23, 1990, Ser. No. 498,285

Claims priority, application Japan, Mar. 29, 1989, 1-79885

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—22 R **11 Claims**



1. An organic positive temperature coefficient thermistor, comprising:

a sheet having a positive temperature characteristic of resistance and comprised of conductive particles dispersed in an organic polymer material;

a plurality of conductive portions extending between first and second opposed side edges of the sheet and arranged substantially parallel with each other on one surface of the sheet with respective first ends of the portions at or adjacent to the first edge and respective, opposed second ends at or adjacent to the second edge of the sheet;

an insulating layer on a part of each conductive portion adjacent to one end or the other end of each conductive portion so that alternate ones of the respective first and second ends of the conductive portions have insulating layers thereon;

first and second power feeding electrodes respectively formed along the first and second side edges so as to extend on the insulating layers and on the part of the conductive portions between the insulating layers in order to electrically connect alternate ones of the first ends of the conductive portions to the first power feeding electrode and to electrically connect alternate ones of the second ends of the conductive portions to the second power feeding electrode.

4,983,945

DEVICE FOR DETECTING MAGNETIZED AREAS

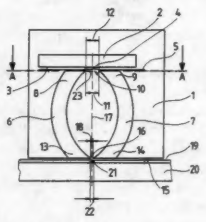
Helmut Becker, Nuremberg, and Armin G. Kissling, Rosstal, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Feb. 27, 1989, Ser. No. 315,577

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806808

Int. Cl.[5] H01L *43/00*

U.S. Cl. 338—32 R **16 Claims**



1. Device for detecting magnetized areas of an object, comprising:

a magnetoresistor in stripe form and having a given width; and

two spaced-apart pole pieces of ferromagnetic material disposed between the magnetoresistor and a magnetized area to be detected, each pole piece having a first end facing the magnetoresistor, said first ends being spaced apart by a first gap having a width approximately equal to the width of the magnetoresistor, each pole piece having a second end remote from the magnetoresistor, said second ends being spaced apart by a second gap having a width narrower than the first gap on the order of magnitude of the width of the magnetized area, the distance between the pole pieces outside the gaps between said first and second ends being much greater than that at the gaps;

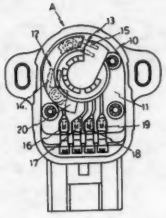
wherein the ends of the pole pieces are faced-ground in planes perpendicular to a connecting line between the two gaps, and said pole pieces extend inclined toward the second gap such that they taper to form acutely-angled inside edges at the second gap.

4,983,946

VARIABLE RESISTOR WITH SWITCHING MECHANISM

Mitsuko Kotaki; Yukihisa Oda, both of Chiryu, and Takayoshi Tsuzuki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 30, 1989, Ser. No. 357,961
Claims priority, application Japan, May 30, 1988, 63-132206
Int. Cl.[5] H01C *10/50, 10/36*
U.S. Cl. 338—200 7 Claims



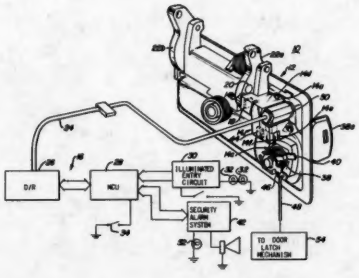
1. A variable resistor having a switching function and comprising:
- a base plate;
- a first electrode provided on the base plate;
- a second electrode provided on the base plate;
- a third electrode provided on the base plate;
- a fourth electrode provided on the base plate simultaneously with formation of the second electrode;
- a resistive element electrically connecting the first and the second electrodes;
- a first switching element including two brushes slidable on surfaces of the third electrode and the resistive element, respectively; and
- a second switching element movable together with the first switching element and including two brushes slidable on surfaces of the first electrode and the fourth electrode respectively.

4,983,947

COMBINATION ILLUMINATED ENTRY/SECURITY ALARM DISARM SWITCH SYSTEM

James E. Mullen, Livonia, and James S. Jurkiewicz, Mt. Clemens, both of Mich., assignors to Chyrsler Corporation, Highland Park, Mich.

Filed Feb. 5, 1990, Ser. No. 474,871
Int. Cl.[5] B60R *25/10, 25/00*
U.S. Cl. 340—426 6 Claims



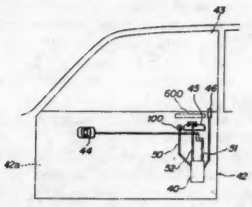
1. A combination illuminated entry and door lock switch for a vehicle door lock assembly that provides switch signals indicative of operating a door handle for turning on interior lights via an illuminated entry control system of a vehicle and a key cylinder switch that provides an indication of key cylinder operation for disarming a security alarm system incorporated in the vehicle, said system comprising:
- (a) a pair of pull levers of the door handle for opening an unlocked vehicle door when the door handle moves from a rest position to a door-unlocked, operated position, a first lever of said pair of levers having a magnet disposed thereon for forming a first magnetic field at a chosen region of said first lever;
- (b) a lock cylinder of the door lock assembly for unlocking the door of the vehicle in response to rotation of a door lock key within said cylinder, said cylinder having magnetic field interruption means disposed to pivot about said cylinder as the door lock key rotates in said cylinder from a lock to an unlock position;
- (c) a non-metallic housing formed to mount to the door handle assembly having a first face of the housing juxtaposed to said first lever and having a slot formed therein to encompass said magnetic interruption means when the lock cylinder rotates to the unlock position, said slot having a first surface; said first surface having another magnet disposed therein for forming a second magnetic field at a chosen region within said slot;
- (d) a first smart sensor means disposed in the first face of said housing having a sensing surface positioned to detect the magnetic field of the magnet disposed on said first lever of said door handle and to produce therefrom, at an output terminal, a voltage signal indicative of sensing the magnetic field when said door handle moves from the rest position to the door-unlocked operated position;
- (e) a second smart sensor means disposed on a surface within said slot of said housing having a sensing surface positioned to sense the magnetic field from said another magnet when said door lock cylinder is in a lock position and to detect an interruption of the magnetic field when the interruption means enters the slot in response to the key being rotated to the unlocked position, said second sensor means producing therefrom a voltage signal indicative of the interruption of the magnetic field of said another magnet;
- (f) single wire bus control means coupled to receive the voltage signals from said first and second smart sensor means via a single wire bus and producing therefrom, at output terminals, control signals multiplexed to the illuminated entry and security alarm systems to turn on the interior lights and to disarm the security alarm system, respectively.

4,983,948

CAR THEFT PROOFING SYSTEM

Sadakatsu Sunami, 8-3, Asukanokita 3-chome, Ikoma-shi, Nara-ken, Japan

Filed Jun. 21, 1989, Ser. No. 368,723
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—426 31 Claims



1. A car theft proofing system comprising an elongate sensor mounted in a space between a car door and a window pane and upwardly of a door lock mechanism for detecting insertion

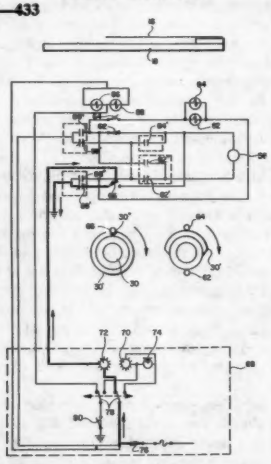
into the space of a plate, bar or other article, an alarm device for giving an alarm, alarm drive means that produces an output signal for driving the alarm device, control means to cause the alarm device to give the alarm in response to a signal received from the elongate sensor and the signal from the alarm drive means, and a radio transmitter for detecting insertion of the article and transmitting a radio wave, wherein said alarm drive means includes a portable remote control transmitter and a receiver disposed on a car body, said remote control transmitter including an abnormality alarm means for transmitting a theft signal in response to the radio wave transmitted from said radio transmitter.

4,983,949

SAFETY UNIT ACTUATING DEVICE

James H. Wicker, Charlotte, N.C., assignor to Specialty Manufacturing Co., Inc., Charlotte, N.C.

Filed Jan. 30, 1989, Ser. No. 303,849
Int. Cl.[5] G08B 5/22
U.S. Cl. 340—433 **18 Claims**



1. An actuating device for operating a safety unit mounted on a vehicle and moved between a first retracted position adjacent the vehicle and a second extended position extending outwardly from the vehicle, such actuating device including:

(a) housing means for mounting said actuating device on said vehicle;

(b) motor means having an output drive means driven by an electric motor;

(c) movable pivot means for supporting and moving said safety unit between said first and second positions, said pivot means being mounted in said housing means;

(d) clutch means interconnecting said motor means and said pivot means, said clutch means normally providing a positive driving engagement between said motor drive means and said pivot means whereby said pivot means is moved by said motor output drive means between said first and second positions, and said clutch means also permitting said pivot means to be moved relative to said motor drive means when a predetermined force is applied at said pivot means; and

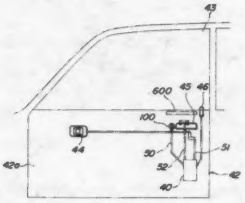
(e) control means for operating said electric motor to selectively move said pivot means between said first and second positions, said control means being selectively operable to cause said electric motor to return said pivot means to said first or second position when it has been moved relative to said motor drive means by the application of said predetermined force; and said clutch means being operable to cause said pivot means to remain at any position to which it is moved relative to said motor drive means until said pivot means is returned to said first or second position by said control means.

4,983,950

CAR THEFT PROOFING SYSTEM

Sadakatsu Sunami, 8-3, Asukanokita 3-chome, Ikoma-shi, Naraken, Japan

Filed Sep. 6, 1988, Ser. No. 240,670
Claims priority, application Japan, Jun. 21, 1988, 63-153781; Jun. 21, 1988, 63-153782; Jul. 11, 1988, 63-172382; Jul. 11, 1988, 63-172383
Int. Cl.[5] B60R 25/10
U.S. Cl. 340—426 **7 Claims**



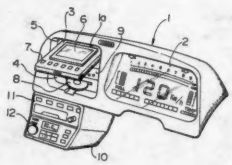
1. A car theft proofing system comprising a cylinder door lock including an outer cylinder (1), an inner cylinder (2) rotatable within said outer cylinder, a first radial bore in said outer cylinder that passes through said outer cylinder, a second bore in said inner cylinder that passes through said inner cylinder, said second bore in said inner cylinder being movable to axially align with said first bore in said outer cylinder, a sensor attached to said cylinder door lock in alignment with said first bore for detecting insertion into said door lock of a door key as well as any other article, an alarm device for giving an alarm, an alarm drive means in alignment with said sensor for producing an output signal for driving said alarm device, and control means to cause alarm device to give an alarm in response to an input signal received by said alarm drive means from said sensor and an output signal from said alarm drive means to said alarm device.

4,983,951

AUTOMOTIVE INFORMATION DISPLAY DEVICE

Osamu Igarashi, Katsuta; Takanori Shibata, Hitachi; Yoji Matuoka, Mito; Kazuhiro Watanabe, Ishioka, and Kunio Terashima, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ibaraki, both of, Japan

Filed Apr. 14, 1989, Ser. No. 338,297
Int. Cl.[5] B60Q 1/00
U.S. Cl. 340—461 **12 Claims**



1. An automotive information display device for displaying various kinds of information in an automobile, comprising:

a processing unit for processing various information in an automobile;

a memory information-reading actuating unit for reading, in

accordance with an instruction given by said processing unit, selected recorded information;

a display unit including a display panel for displaying the information read by said information-reading actuating unit;

an instrument panel having an opening portion formed therein in which opening portion said processing unit, said actuating unit and said display unit are received; and

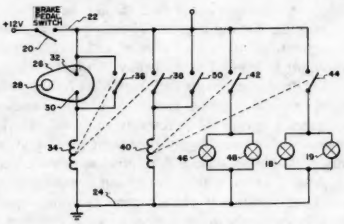
means for mounting said display unit in the opening portion so as to be retracted into or extracted from said opening portion and rotatable about a first axis when the display unit has been extracted from the opening portion, while said display panel is mounted in said display unit so as to be movable about a second axis transverse to said first axis, to position said display panel for viewing.

4,983,952

BRAKE ACTUATED FLASHING LIGHT SYSTEM FOR A MOTOR VEHICLE

Ravindra G. Athalye, Thousand Oaks, Calif., assignor to Improved Performance Systems, Inc., Irvine, Calif.

Filed Jan. 10, 1990, Ser. No. 462,752
Int. Cl.[5] B60Q *1/50*
U.S. Cl. 340—467 **3 Claims**



1. In combination with a motor vehicle, said motor vehicle having a braking system, a light signal system connected to said motor vehicle, said light signal system being actuated by said braking system, said light signal system including an emergency flashing light system, said light signal system comprising:

means for activating said emergency flashing light system, said means including an inertially sensitive switch, said inertially sensitive switch being movable between a normally open position and a closed position, said inertially sensitive switch being supported by support means, a slow deceleration of said motor vehicle causes said inertially sensitive switch to be held in said open position, quick deceleration of said motor vehicle causes said inertially sensitive switch to move to said closed position causing activation of said emergency flashing light system; and

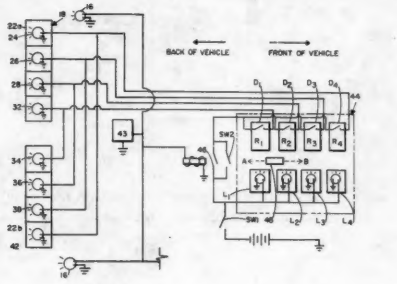
said support means comprising an elongated strip member, said elongated strip member being mounted on a pivot axis to a housing, said housing to be fixedly attached to said motor vehicle, said inertially sensitive switch including a mercury bubble switching device, said mercury bubble switching device being mounted on said strip member distally located from said pivot axis, said mercury bubble switching device being mountable on said strip member at various positions so as to distally vary the location of said mercury bubble switching device from said pivot axis, whereby the closer said mercury bubble switching is to said pivot axis the slower the reaction time in activating said mercury bubble switching device.

4,983,953

G METER

Robert W. Page, 195B N. Fehr Way, Bay Shore, N.Y. 11706

Filed Nov. 1, 1989, Ser. No. 429,999
Int. Cl.[5] B60Q *1/26*
U.S. Cl. 340—467 **8 Claims**



1. A rear end collision avoidance system for a vehicle comprising:

a. means for displaying a series of rearward facing lamps, said lamps being arranged in a horizontal row in which a first pair of lamps represents a rate of deceleration, a second pair of lamps located on opposite sides of said first pair of lamps in said row closer to the sides of said vehicle representing an increased rate of deceleration, and a third pair of lamps located on opposite sides of said second pair of lamps in said row closer to the sides of said vehicle representing a further increase in the rate of deceleration;

b. deceleration measurement means comprising sensor means to detect and measure the rate of deceleration of said vehicle within said vehicle for actuating said displaying means to cause said pairs of lamps to light up and turn off sequentially in opposite directions along said row in accordance with increasing and decreasing deceleration of said vehicle so that the glowing of a particular pair of lamps replaced by the glowing of an adjacent pair of lamps unambiguously represents a particular range and change of deceleration; and

c. means for activating said displaying means upon the application of the brake within said vehicle so that said displaying means operates continuously to indicate the rate of deceleration until said brake is released.

4,983,954

SHOCK HAZARD WARNING DEVICE

Steven W. Huston, Agoura Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

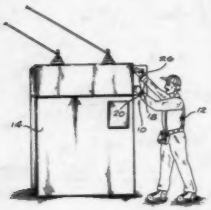
Filed Sep. 29, 1989, Ser. No. 414,813
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—657 **9 Claims**

1. A shock hazard warning device for detecting and indicating the presence of electrical shock hazard in connection with electrical equipment, said device comprising:

detection means for detecting an electrical signal generated by the electrical equipment, said detection means including a pair of electrodes, means for mounting said electrodes onto a person's body, and means for combining signals detected by said electrodes to provide a composite detected signal;

comparison means for comparing said composite detected signal relative to a selected reference signal representing a

selected threshold level representative of an unacceptable shock hazard; and



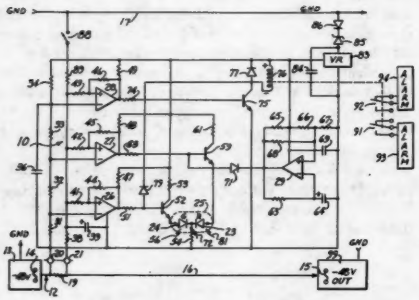
alarm means activated by said comparison means when an unacceptable shock hazard is present.

4,983,955

ELECTRIC POWER SUPPLY CIRCUIT MONITORING SYSTEMS

Howard M. Ham, Jr., Santa Ynez, and James J. Keenan, Santa Barbara, both of Calif., assignors to Hendry Mechanical Works, Goleta, Calif.

Filed Nov. 28, 1988, Ser. No. 276,959
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—664 **46 Claims**



2. In a method of monitoring an electric power distribution circuit having a rated load capacity, the improvement comprising in combination the steps of:

supplying electric power through said circuit;

continually sensing an intensity of said electric power supplied through said circuit;

electrically providing in response to said sensing a first signal indicating when electric power is supplied through said circuit at a predetermined maximum current usage below rated load capacity;

electrically providing in response to said sensing a second signal indicating a safe loading condition when said sensed intensity is substantially below said maximum current usage; and

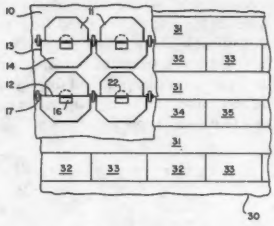
electrically providing in response to said sensing a third signal indicating when said intensity is at a value between said safe loading condition and said maximum current usage.

4,983,956

DISPLAY ARRANGEMENT

Hassan P. A. Salam, London, England, assignor to Unisplay S.A., Geneva, Switzerland

Filed Oct. 13, 1988, Ser. No. 256,590
Int. Cl.[5] G09G *3/34*
U.S. Cl. 340—783 **4 Claims**



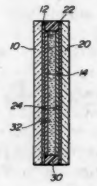
1. A display matrix having horizontal and vertical rows of display elements each including a magnetically operable shutter rotatable about an axis between a first position in which said display element appears dark and a second position in which it appears bright, said display matrix being arranged to be switchable between a first mode in which it appears monochromatic and a second mode of lower resolution in which it can display images of more than one color said display matrix including an opaque member having a group of light-passing areas each selectively coverable by a said shutter and including a light source common to several said display elements arranged to back-light the display elements and further including a sheet of light-passing material common to several said display elements said sheet having group of differently colored light-passing zones corresponding to said group of light passing areas said sheet being movable between a first location in which each of said light passing areas within the group has a different coloured said zone opposite it and a second location wherein all of said display elements are identical to each other in color, said display matrix including actuating means connected with said common sheet arranged to move it from one to the other of said locations.

4,983,957

ELECTROCHROMIC DISPLAY DEVICE CAPABLE OF DISPLAY IN PLURAL COLORS

Masazumi Ishikawa, Yokosuka; Yasuhiko Osawa, Tokyo; Hiroshi Inaba, Matsusaka; Kiyoshi Nakase, Mie, and Yukitoshi Yanagida, Matsusaka, all of Japan

Filed May 20, 1988, Ser. No. 196,715
Claims priority, application Japan, May 29, 1987, 62-131286
Int. Cl.[5] G09G *3/34*
U.S. Cl. 340—785 **7 Claims**



1. An electrochromic device, comprising;

a transparent first substrate laid with a transparent electrode layer;

a second substrate which comprises an electrode layer and is arranged opposite to and spaced from the first substrate

such that the electrode layers of the respective substrates are opposite to each other;

a first electrochromic layer which is formed on the electrode layer of the first substrate and is formed of a first electrochromic material selected from a group of materials of a particular coloring type and which takes on a characteristic first color in its electrochemically fully oxidized state;

a second electrochromic layer which is formed on the electrode layer of the second substrate and is formed of a second electrochromic material selected from said group of materials and which takes on a characteristic second color different from said first color in its electrochemically fully oxidized state;

seal means for holding the first and second substrates in the opposite and spaced arrangement and airtightly defining a space between the first and second substrates; and

an electrolyte liquid which fills up the space defined between the first and second substrates.

4,983,958

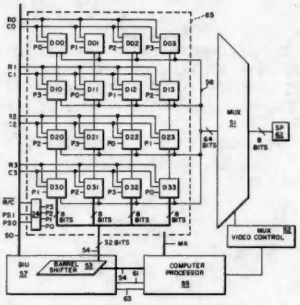
VECTOR SELECTABLE COORDINATE-ADDRESSABLE DRAM ARRAY

Paul Carrick, Los Gatos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 29, 1988, Ser. No. 149,710

Int. Cl.[5] G09G *1/02*

U.S. Cl. 340—799 **29 Claims**



1. In a computer system, a dynamic random access memory array cell which comprises;

memory storage means of a logical array of logical rows and logical columns for storing data arranged in physical rows and physical columns such that each of said storage means of the same said physical column is coupled to and shares a section of a data bus line, where no two of said storage means of the same said logical column lies on the same said physical column;

a data bus coupled to said storage means and a bus interface means, said data bus partitioned into sections for transmitting data, such that each said section can carry said data contained in one of said storage means;

a multiplexed address bus coupled to a computer processor and each of said storage means for sending a coordinate address comprising a row address and a column address;

said bus interface means coupled to said storage means, said data bus, a decoder, and said computer processor, for enabling said storage means such that no more than one storage means per said section of said data bus is enabled, said bus interface means having a barrel shifter for shifting data from the data bus;

said computer processor coupled with said multiplex address bus and said bus interface means, said computer processor for generating coordinate addresses on said multiplex address bus;

decoder means coupled with said bus interface means for generating enable signals for said storage means.

4,983,959

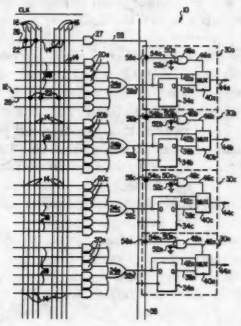
LOGIC OUTPUT MACROCELL

Robert K. Breuninger, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 914,201, Oct. 1, 1986, abandoned. This application Oct. 28, 1988, Ser. No. 266,238

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.83 **25 Claims**



1. A combinatorial logic device comprising:

a combinatorial logic matrix having a nonregistered output and a selecting output;

a register receiving said nonregistered output and generating a registered output;

a selector independent from said register and having an external output for selecting either said registered output or said nonregistered output for coupling to said external output responsive to said selecting output;

wherein said selector includes an element for permanently selecting between said registered and said nonregistered outputs.

4,983,960

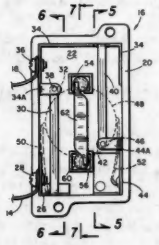
PORCH OR ENTRY SWITCH PROVIDING EMERGENCY SIGNALS

Richard P. Dunn, 4701 Sisk Rd., Wichita Falls, Tex. 76310

Filed Mar. 13, 1989, Ser. No. 322,281

Int. Cl.[5] H04B *1/00*; H01H *9/00*; G08B *5/00*

U.S. Cl. 340—825.170 **1 Claim**



1. A switch which may be used such as for controlling a porch light for providing an emergency signal, the switch comprising:

a switch body of non-conductive material having an open top cavity therein;

a first fixed electrical contact member secured to said switch body within said cavity and having a first means for connecting a first electrical conductor thereto;

a second fixed electrical contact member secured to said switch body within said cavity and having second means to connect a second electrical conductor thereon;

a third fixed electrical contact member secured to said switch body within said cavity and having third means to connect a conductor thereto;

a first elongated leaf spring of electrical conductive material secured at one end thereof to said first fixed electrical contact member and having a contact point at the other end thereof, the contact point engaging said second fixed contact member when the first leaf spring is in its non-deflected position;

a second elongated leaf spring of electrical conductive material secured at one end thereof to said second fixed contact member and having at the other end thereof a contact point engaging said third fixed contact member when the second leaf spring is in its non-deflected position;

a flasher means secured to said switch body and having two electrical conductors extending therefrom, one of said conductors being connected to said first fixed contact member and the other conductor being connected to said third fixed contact member;

a toggle pivotally supported within said switch body having integral actuator post portions extending therefrom, the toggle being supportable in a first "OFF" position wherein said post portions deflect both said leaf springs whereby no continuity is provided through said switch between said first and second electrical contact members, and a second or "ON" position wherein said post portions permit said first leaf spring to return to its non-detected position providing continuity between said first and second fixed electrical contact members, and a third or "FLASHER" position wherein said posts deflect said first leaf spring but permit said second leaf spring to return to its non-deflected position providing continuity between said first and second fixed electrical contact members through said flasher means;

a toggle plate affixed to said switch body closing said cavity therein and pivotally receiving said member within said switch body cavity;

a position retention bar positioned within said switch body and in contact with said toggle; and

spring bias means urging said position retention bar against said toggle and said toggle against said toggle plate to retain said toggle in position when said toggle plate is secured to said switch body.

4,983,961

THREE STAGE NON-BLOCKING SWITCHING ARRAY

Siegfried Brünle, Backnang, and Klaus Eberspächer, Weissach, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH

Filed Jan. 27, 1989, Ser. No. 302,465

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802579

Int. Cl.[5] H04Q *1/00*; H04B *3/38*

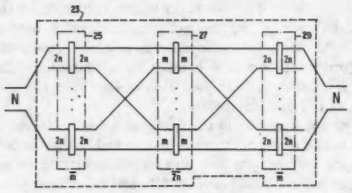
U.S. Cl. 340—825.8 **12 Claims**

1. In a three stage non-blocking switching array for a plurality of input lines, and including an input stage having a plurality of sub-arrays each having a plurality of inputs and outputs, and with the input lines being distributed to said inputs of said sub-arrays of said input stage, an output stage having a plurality of sub-arrays each having a plurality of inputs and outputs, and an intermediate stage having a plurality of sub-arrays, each having a plurality of inputs and outputs, for establishing connections between said outputs of said input stage and said inputs of said output stage; the improvement wherein:

the number of said inputs and outputs of said input stage and of said output stage is at least twice the number of said input lines, whereby said sub-arrays of said input stage each have at least one primary input connected to an input line and at least one redundant input, and said sub-arrays of said output stage each have at least one primary output and at least one redundant output;

said intermediate stage has at least one sub-array more than is required for a non-blocking switching array;

each primary input of each said input stage subarray is connected individually to a respective redundant input of a respective different one of the other of said sub-arrays of said input stage; and,



each primary output of each said output stage sub-array is connected to a respective redundant output of a respective different one of the other of said sub-arrays of said output stage.

4,983,962

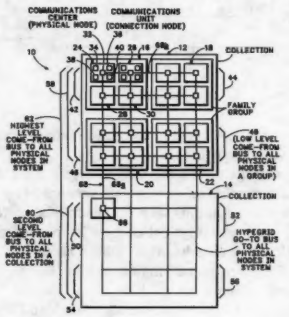
NEURAL-MODEL, COMPUTATIONAL ARCHITECTURE EMPLOYING BROADCAST HIERARCHY AND HYPERGRID, POINT-TO-POINT COMMUNICATION

Daniel W. Hammerstrom, 19973 SW. Oak Ct., Aloha, Oreg. 97007

Filed Sep. 14, 1987, Ser. No. 95,941

Int. Cl.[5] H04Q *9/00*

U.S. Cl. 340—825.02 **2 Claims**


COMMUNICATIONS CENTER (PHYSICAL NODE)
COMMUNICATIONS UNIT (CONNECTION NODE)
COLLECTION
FAMILY GROUP
HIGHEST LEVEL COME-FROM BUS TO ALL PHYSICAL NODES IN SYSTEM
(LOW LEVEL COME-FROM BUS TO ALL PHYSICAL NODES IN A GROUP)
SECOND LEVEL COME-FROM BUS TO ALL PHYSICAL NODES IN A COLLECTION
HYPERGRID GO-TO BUS TO ALL PHYSICAL NODES IN SYSTEM

1. A neural-model, broadcast-hierarchial-capable, locality-of-communication-dominant, information-handling architecture structure comprising

plural communication centers organized into plural information-handling collections of communication centers, including at least plural information-handling families, which are organized into plural information-handling groups, said communication centers within each family being connected to a first information-handling level, and said communication centers within each group being connected to a second information-handling level, each level including a broadcast communication bus connected to said communication centers, which bus is specific to its level, communication within said levels taking place over

said buses only by way of broadcast, come-from addressing, and

a third communication level including a hypergrid bus connected to said communication centers enabling long-distance, non-broadcast, point-to-specific-point, go-to-address-only communication between such centers exclusively via said hypergrid bus.

4,983,963

ELECTROMAGNETIC COMMUNICATION INTERFACE

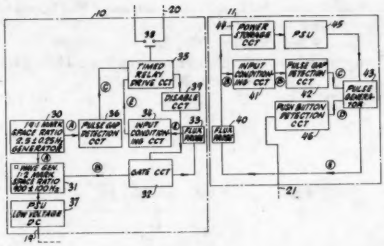
John L. Hodgetts, Rochford, and Martin J. Hodson, Rayleigh, both of England, assignors to The Raytel Group Limited, Essex, England

Filed May 31, 1989, Ser. No. 359,401

Claims priority, application United Kingdom, Mar. 1, 1989, 8904644

Int. Cl.[5] G08C 19/16; E05F 11/00; H04Q 7/00

U.S. Cl. 340—870.31 3 Claims



1. An electromagnetic communication interface comprising:

a first unit including a first coil and first circuit means for modulating the magnetic flux produced by the first coil and for responding to modulations of the magnetic flux cutting the first coil, the first circuit means including power input means connectable to an external power source and arranged to modulate the magnetic flux produced by the first coil into groups of first pulses;

and a second unit movable relatively to the first unit and including a second coil and second circuit means for modulating the magnetic flux produced by the second coil and for responding to modulations of the magnetic flux cutting the second coil; the second circuit means including energy storage means for storing the energy derived from the magnetic flux produced by the first coil of the first unit;

wherein one of the first and second units also includes a core positioned within the coil of the said one unit and having a free end projecting out of said coil, whereby, when the free end of the core is inserted into the coil of the other of the first and second units, the magnetic flux produced by the first coil cuts the second coil and the magnetic flux produced by the second coil cuts the first coil;

wherein the second circuit means includes input signal input means and is arranged, in response to the input signal input means receiving an input signal and upon detecting a gap between the groups of first pulses of the magnetic flux produced by the first coil cutting the second coil, to use energy stored in the energy storage means to modulate the magnetic flux produced by the second coil into a second pulse; and

wherein the first circuit means includes output signal output means and is arranged, upon detecting the second pulse of the magnetic flux produced by the second coil cutting the first coil, to output an output signal from the output signal output means.

4,983,964

SYSTEM FOR DATA TRANSMISSION

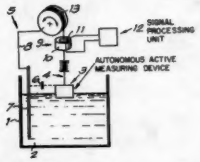
Leo Van de Pas, Merksem, Belgium, assignor to Elektriciteit Voor Goederenbehandling Marine en Industrie, in het verkart "Egemin", naamloze vennootschap, Schoten, Belgium

Filed Jun. 29, 1988, Ser. No. 212,791

Claims priority, application Belgium, Jul. 1, 1987, 8700738

Int. Cl.[5] G08C 19/06; G01F 23/26

U.S. Cl. 340—870.31 20 Claims



1. System for the transfer of data in a measuring instrument, whereby a measuring device is being introduced in a medium housed in a receptacle in order to measure specific properties of said medium and to transfer the measuring data, comprising: an autonomous active measuring device; a freely movable electrically conductive element to which the autonomous active measuring device is connected; a signal reception unit through which the electrically conductive element, without making a physical or galvanic contact, can move freely; a signal processing unit connected electrically to the signal reception unit; and an electrical connection located outside of said signal reception unit connecting the electrically conductive freely moveable element and the medium to be tested.

4,983,965

DEMODULATION APPARATUS

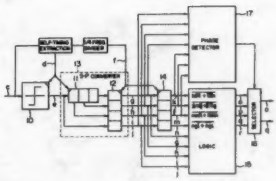
Nobukazu Doi, Hachioji; Morishi Izumita, Inagi; Seiichi Mita, Kanagawa, and Yoshizumi Eto, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 444,845

Claims priority, application Japan, Dec. 9, 1988, 63-309881

Int. Cl.[5] H03M 5/14, 9/00

U.S. Cl. 341—72 6 Claims



1. A demodulation apparatus comprising:

serial-to-parallel conversion means for converting a Miller-squared code signal or a Miller code signal supplied as a serial signal to parallel signals;

first means for deriving n-phase virtual demodulated signals from said parallel signals;

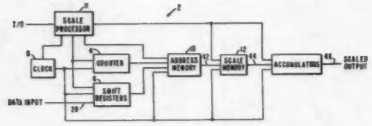
phase detection means for detecting phase information from a specific pattern of said parallel signals; and

selection means for selecting n/2-phase virtual demodulated signals out of n-phase virtual demodulated signals in response to said phase information.

4,983,966
HIGH-SPEED UNIVERSAL SCALER

Donald J. Grose, Reisterstown, and Randy J. Kelsey, Hampstead, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1990, Ser. No. 470,473
Int. Cl.[5] H03M 7/12
U.S. Cl. 341—84 **18 Claims**



1. A circuit for the real time generation of scaled values of a series of transmitted datawords, wherein each dataword is formed from N bits formed from M bit patterns, where M in an integer equal to or less than N but greater than one, comprising:

a memory means having an address input specifying an address location, each address location being loaded with a different scaling number determined by a scaling factor, each scaling number comprising a component of a scaled value, and having an output for transmitting all of said components of each scaled value;

a latching means connected to the input of said memory means for delivering the address input to the memory means;

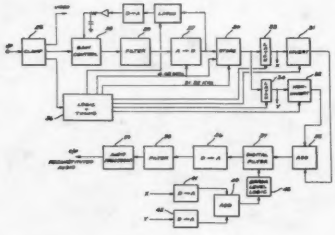
an accumulator means connected to the output of said memory means for adding all of said components into a scaled value for said dataword;

a shift register means connected to said latching means for accumulating datawords and transmitting the bit patterns that form said datawords to said latching means.

4,983,967
TRANSMISSION OF AUDIO IN A VIDEO SIGNAL

Hugh McKenzie, St. Ives, Australia, assignor to I.R.T. Electronics Pty. Limited, Australia

Filed Oct. 14, 1988, Ser. No. 257,736
Claims priority, application Australia, Oct. 16, 1987, PI4929
Int. Cl.[5] H03M 1/00; H04N 9/00
U.S. Cl. 341—110 **16 Claims**



1. A method of encoding an audio signal onto and decoding an audio signal from a video signal, the method comprising the encoding steps of;

(A) encoding an audio signal onto a video signal, comprising the steps of:

(1) sampling successive portions of the audio signal;

(2) time compressing the sampled audio signal portions;

(3) inserting successive ones of the time compressed audio signal portions in analogue form into predetermined lines of the video signal; and

(4) inserting distortion cancelling signals into further predetermined lines of the video signal, each distortion cancelling signal being associated with a respective audio signal portion; and thereafter

(B) decoding the audio signal from the video signal, comprising the steps of:

(1) separating the successive time compressed audio signal portions and the distortion cancelling signals from the video signal;

(2) storing successive ones of the audio signal portions;

(3) storing successive ones of the distortion cancelling signals;

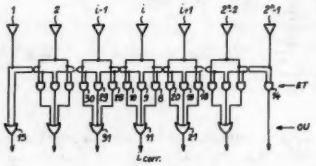
(4) adding associated ones of the stored audio signal portions and distortion cancelling signals in inverted form relative to one another such that perturbations present in the associated signals will cancel to zero; and

(5) time expanding and re-assembling the audio signal portions.

4,983,968
PARALLEL ANALOG-DIGITAL CONVERTER WITH ERROR-CORRECTION CIRCUIT

Truong-Thao Nguyen, Bures sur Yvette, and Francois R. Thomas, Vanves, both of France, assignors to Thomson Composants Microondes, Puteaux, France

Filed Oct. 10, 1989, Ser. No. 418,538
Claims priority, application France, Oct. 14, 1988, 88 13539
Int. Cl.[5] H03M 1/06, 1/36
U.S. Cl. 341—118 **3 Claims**



1. A parallel analog-digital converter, called a "flash" analog-digital converter, comprising a first stage formed by a plurality of parallel-mounted comparators which convert an analog value, applied to a common input of said comparators, into a binary value formed by a sequence of logic "ones" and then a logic "zeros", said sequence being called a thermometer scale, and also comprising a second stage which is an encoder stage which converts the values of the thermometer scale into a binary number, said converter further comprising, inserted between the first and second stages, a third stage which is a corrector stage, the function of which is to correct an accidentally erroneous output value B of a comparator, said value B presenting an anomaly in the thermometer scale, the corrector stage giving a corrected output value B_{corr} that is homogeneous with the thermometer scale;

with A, B and C being output logic values, respectively, of three neighboring order i+1, order i and order i−1 comparators in the first stage, the third corrector stage forces the output B of the order i comparator to take the same corrected value B_{corr} as the outputs A and C of the Two orders i+1 and i−1 comparators, if and only if these two output values A and C are equal, and opposite to the output value B of the order i comparator, verifying the Boolean function:

$$B_{corr} = (A \text{ and } C) \text{ or } [B \text{ and } (A \text{ or } C)]$$

or

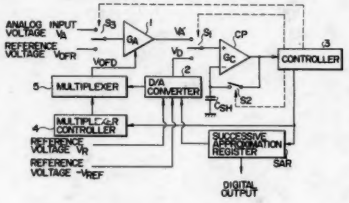
$$B_{corr} = A.C + B.A. + B.C.$$

4,983,969

SUCCESSIVE APPROXIMATION ANALOG TO DIGITAL CONVERTER

Yoshihiro Iwamoto, Kawasaki, and Tetsuya Iida, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1988, Ser. No. 287,212
Claims priority, application Japan, Dec. 23, 1987, 62-325682
Int. Cl.[5] H03M 1/06
U.S. Cl. 341—118 **17 Claims**



1. An A/D converter device having an input and output, said device being of the type having a conversion cycle and a compensation cycle wherein conversion of an analog input signal provided at the input of the device into digital data is carried out during the conversion cycle, and compensation of an offset of the device is carried out during the compensation cycle, comprising:

first means responsive to the input of the device for selecting one of an analog input signal and an offset compensation reference signal, provided to the input of the device;

means responsive to said first selecting means for amplifying a selected signal from the first selecting means;

means for converting digital input data into an analog signal, said converting means includes means for providing a predetermined analog signal;

second means responsive to the amplifying means and converting means for selecting one of an amplified signal and an analog signal provided from said converting means;

means for comparing a selected signal from the second selecting means with a reference signal to output a signal therefrom;

means for providing said reference signal to the comparing means;

means for providing digital data to the converting means in response to a signal output from the comparing means;

means coupled to the amplifying means for providing an analog offset compensation signal to the amplifying means, said analog offset compensation signal being added to the selected signal from said first selecting means;

means for controlling said first and second selecting means;

means coupled to said comparing means for holding the signal output from the comparing means; and

an output circuit, coupled to the means for providing digital data, for providing the digital data to the output of said A/D converter device,

said controlling means further comprising means for providing that, during the conversion cycle, said first selecting means selects said analog input signal, said second selecting means selects said amplified signal, and said holding means holds the signal output from said comparing means, and, when conversion of the analog input signal to a digital signal is completed, said second selecting means selects said signal from said converting means, the comparing means compares said selected signal from the converting means with said reference signal provided to the comparing means, and said means for providing digital data to the converting means provides the digital data in accordance with the signal output from the comparing means, the analog input signal added to the analog offset compensation signal to convert the sum into a digital signal, and

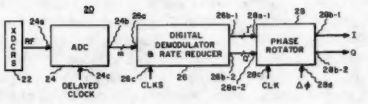
said controlling means comprising means for providing that, during the compensation cycle, the converting means provides a predetermined analog signal to the comparing means, the first selecting means selects said offset compensation reference signal, the second selecting means selects said amplified signal, and said holding means holds the signal output from the comparing means and, when compensation of the offset of the device is completed, the second selecting means selects the predetermined analog signal from the converting means, the comparing means compares the predetermined analog signal with said reference signal provided to the comparing means, and said means for providing an analog offset compensation signal provides the analog offset compensation signal in accordance with the signal output from the comparing means the provided analog offset compensation signal compensating the offset of the converted signal.

4,983,970

METHOD AND APPARATUS FOR DIGITAL PHASED ARRAY IMAGING

Matthew O'Donnell, Schenectady; William E. Engeler, Scotia; John J. Bloomer, and John T. Pedicone, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 28, 1990, Ser. No. 500,164
Int. Cl.[5] H03M 1/54
U.S. Cl. 341—122 **21 Claims**



1. A method for digitally forming a beam of energy substantially focussed at a range R and at an angle θ with respect to a transducer array having a plurality N of transducers, each in a separate channel and receiving a portion of the energy of the beam, comprising the steps of:

(a) separately generating for each j-th channel, where $1 \leq j \leq N$, a stream of sampling strobe signals at a fixed common sample rate F;

(b) converting the amplitude of an analog signal from the transducer in each channel into a baseband data signal comprised of consecutive data words each responsive to one of said strobe signals;

(c) digitally processing only those baseband data signals converted, in the j-th channel, after a coarse time delay, determined by range R and angle θ and unique to that channel, has elapsed after a start time to common to all N channels;

(d) phase rotating the baseband data signals in each channel by a fine time delay to obtain a total delay time in each channel predetermined by range R and angle θ, and

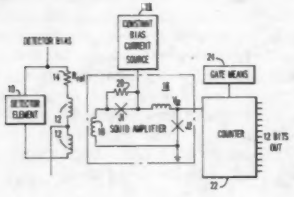
(e) coherently summing all N of the separately-delayed baseband data signal streams to obtain a single set of digital baseband data words representing at least amplitude information from the formed energy beam.

4,983,971

JOSEPHSON ANALOG TO DIGITAL CONVERTER FOR LOW-LEVEL SIGNALS

John X. Przybysz, Penn Hills, Pa., and Clark A. Hamilton, Boulder, Colo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1989, Ser. No. 372,990
Int. Cl.[5] H03M 1/12
U.S. Cl. 341—133 6 Claims



1. A superconducting analog-to-digital converter for producing a digital output signal which is a function of an analog input signal, said analog-to-digital converter comprising:

a. a nonhysteresis-shunted Josephson junction, an input superconducting inductor, and an output Josephson junction, connected in superconducting loop relationship;

b. means for coupling flux proportional to said analog input signal into said input inductor;

c. a constant bias current source connected in a manner that said nonhysteresis-shunted Josephson junction and said output Josephson junction are in parallel with respect to said current source, said bias current source providing a current having a magnitude equal to about the sum of the saturation current of said Josephson junctions;

d. a Josephson junction integrating counter circuit connected to sense the ac portion of voltage across said output Josephson junction; and

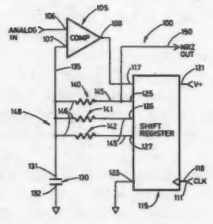
e. means for gating said Josephson junction integrating counter circuit, whereby the number of oscillations in the voltage across the output Josephson junction in a predetermined period of time is a function of the analog input signal and the count of the Josephson junction integrating counter circuit during the predetermined period provides a digital output which is a function of the input signal.

4,983,972

VIDEO DELTA MODULATION ENCODER

George T. Mills, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 13, 1989, Ser. No. 422,315
Int. Cl.[5] H03M 3/02
U.S. Cl. 341—143 11 Claims



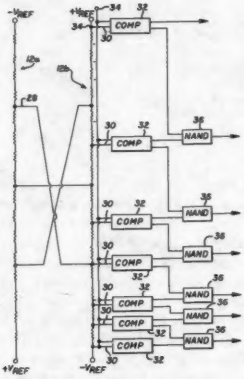
1. In an integrating circuit for variable slope delta modulation wherein the circuit provides a plurality of slopes for an integrated signal by selection between a plurality of charging rates for an integrating capacitor, the improvement comprising said plurality of charging rates being determined by a plurality of charging voltages individually corresponding to said charging rates.

4,983,973

NON-LINEAR ANALOG-TO-DIGITAL CONVERTER

Lanny L. Lewyn, Laguna Beach, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed May 22, 1989, Ser. No. 354,864
Int. Cl.[5] H03M 1/36, 1/78; H01C 10/04
U.S. Cl. 341—138 28 Claims



1. In combination for use in an analog-to-digital converter, an integrated circuit chip,

a thin resistive film disposed on the chip to provide a resistance having progressively increasing values at progressive positions on the integrated circuit chip,

a plurality of taps disposed on the film at progressive positions on the film in a particular non-linear relationship,

means for introducing a particular voltage to the thin film at one end of the thin film,

means for introducing a reference voltage to the thin film at the opposite end of the thin film to obtain a production of voltages on individual ones of the taps in a non-linear relationship depending upon the positioning of the taps,

a plurality of comparators,

means for introducing an input voltage to the comparators,

means for introducing the voltages on the individual ones of the taps to individual ones of the comparators to provide a comparison between the input voltage and the voltages on such individual ones of the taps, and

means for providing an indication in digital form of the output from a particular one of the comparators in which the input voltage is substantially equal to the voltage introduced to such particular comparator from the tap associated with such particular comparator.

4,983,974

ANALOG-TO-DIGITAL CONVERSION BY VARYING BOTH INPUTS OF A COMPARATOR UTILIZING SUCCESSIVE APPROXIMATION

Dejan Mijuskovic, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 6, 1990, Ser. No. 475,497
Int. Cl.[5] H03M 1/34
U.S. Cl. 341—156 14 Claims

1. A method of converting an analog input signal into a

digital output signal representative of the magnitude of the analog input signal, comprising the steps of:

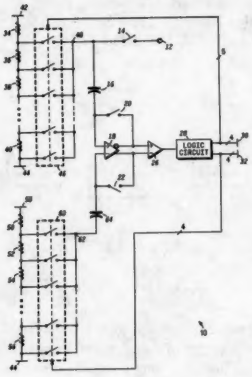
developing first and second pluralities of reference potentials and providing a selected one of said first plurality of reference potentials according to a first portion of a digital control signal and a selected one of said second plurality of reference potentials according to a second portion of said digital control signal;

storing a first signal representative of the magnitude of the analog input signal;

balancing said first signal and the least of said second plurality of reference potentials to establish a substantially zero differential input signal;

disabling the analog input signal;

comparing said first signal with ones of said first plurality of reference potentials as determined by said first portion of said digital control signal;



adjusting said first portion of said digital control signal until one of said first plurality of reference potentials reduces said differential input signal to a first minimum level;

comparing the difference between said first signal and said one of said first plurality of reference potentials with ones of said second plurality of reference potentials as determined by said second portion of said digital control signal; and

adjusting said second portion of said digital control signal until one of said second plurality of reference potentials reduces said differential input signal to a second minimum level wherein the final value of said first portion of said digital control signal represents the most significant bits of the digital output signal and the final value of said second portion of said digital control signal represents the least significant bits of the digital output signal.

4,983,975

A/D CONVERTER

Kimihiro Sugino, and Mitsumasa Satoh, both of Ohme, Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,289

Claims priority, application Japan, Apr. 2, 1988, 63-81603

Int. Cl.[5] H03M *1/50*

U.S. Cl. 341—166 **48 Claims**

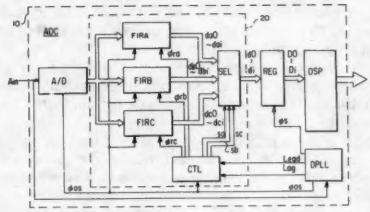
1. A signal processing circuit, comprising:

first signal processing means having a first transfer function variable with time over a fixed timed period of a first cycle and repeating at a first frequency;

second signal processing means having a second transfer function variable with time over a second cycle equal in length of time to said first cycle and repeating at said frequency, said first transfer function being substantially equal to said second transfer function, and each transfer function being unstable for an initial portion of a cycle when the phase of its frequency is changed;

input means for splitting an input into two substantially equal inputs and respectively feeding said two substantially equal inputs to said first and second signal processing means;

select means for receiving outputs from each of said signal processing means; said select means, in response to a control signal, outputting a selected one of said outputs from said signal processing means;



control means for providing said input control signal to said select means for selecting said first signal processing means without changing its phase and for changing the phase of said second signal processing means for at least one cycle; and

thereafter, said control means, for a subsequent cycle, providing said control signal to said select means for selecting said second signal processing means without changing its phase and for changing the phase of said first signal processing means for at least one cycle.

4,983,976

SIGNAL TRANSMISSION SYSTEM AND METHOD

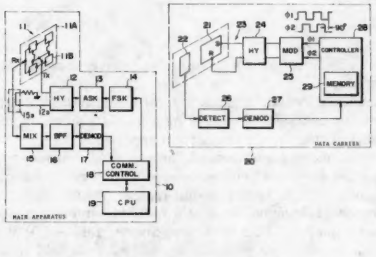
Akimitsu Ogata, Takatsuki; Hisato Fujisaka, Izumi; Sadao Igarashi, Kamifukuoka; Toshimitsu Nozu, Hino; Katsura Onozato, Tokyo; Masanobu Hirose, Fuchu, and Katsuji Miwa, Souka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 12, 1989, Ser. No. 364,326

Claims priority, application Japan, Jun. 17, 1988, 63-148165; Oct. 27, 1988, 63-269571

Int. Cl.[5] G08G *1/01*

U.S. Cl. 342—42 **19 Claims**



1. A signal transmission system comprising:

a data carrier;

a memory located in said data carrier to store therein data including an identification code associated with an object;

a main apparatus having a microwave oscillator so as to effect communications with said data carrier by use of a microwave, enabling said main apparatus to write data into or read data from said memory of said data carrier;

first modulating means connected to said main apparatus for

modulating said microwave by use of a command or data to be sent to said data carrier;

first transmit means connected to said main apparatus for transmitting said modulated microwave and for thereafter transmitting a nonmodulated microwave carrier for a predetermined period of time;

first receiving means attached to said main apparatus for receiving a microwave returned from said data carrier so as to demodulate the received microwave to obtain data;

second receiving means connected to said data carrier for receiving said microwave sent from said first transmit means so as to demodulate the received microwave to obtain a command or data;

control means connected to said data carrier for executing a read/write operation on said memory depending on the received command;

second transmit means connected to said data carrier for returning to said main apparatus response data indicating that a read/write operation has been conducted on said memory;

antenna means connected to said second transmit means for receiving said monmodulated microwave carrier and for reflectively transmitting a modulated microwave; and

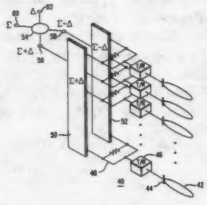
second modulating means connected to said antenna means for changing reflection coefficients of the microwave in said antenna means in four levels in a sense of a vector depending on response data to be transmitted, thereby conducting a modulation of quadrature phase-shift keying on the received microwave carrier.

4,983,977

ARCHITECTURE FOR MONOPULSE ACTIVE APERTURE ARRAYS

Peter D. Hrycak, Millersville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1990, Ser. No. 481,039
Int. Cl.[5] G01S *13/44*
U.S. Cl. 342—153 **1 Claim**



1. An architecture for monopulse, active aperture arrays, comprising:

at least one radiating antenna means, said radiating antenna means operable to receive or transmit a signal from outside of said monopulse, active aperture array;

a least one transmit-receive means, said transmit-receive means cooperatively associated with said radiating antenna means, said transmit-receive means operable to receive said signal from said radiating antenna means;

at least one −3.01 dB Wilkinson divider, said −3.01 Wilkinson divider cooperatively associated with said transmit-receive means, said −3.01 dB Wilkinson divider operable to receive said signal from said transmit-receive means and split said received signal from said transmit-receive means in half;

a sum plus difference network (S+D), said sum plus difference (S+D) network cooperatively associated with said −3.01 dB Wilkinson divider, said sum plus difference network operable to receive said one-half of said received signal from said −3.01 Wilkinson divider;

a sum minus difference (S−D) network, said sum minus difference (S−D) network cooperatively associated with said −3.01 Wilkinson divider, said sum minus difference network operable to receive said one-half of said received signal from said −3.01 dB Wilkinson divider; and,

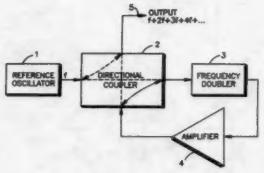
a four port magic tee, said four port magic tee operable to receive an output signal from said Sum plus Difference network (S+D) and said four port magic tee operable to receive an output signal from said Sum minus Difference (S−D) network, said four port magic tee being further operable to output an error compensated Summed signal or an error compensated Difference signal.

4,983,978

MULTI-FREQUENCY COMB GENERATOR FOR RADAR AND THE LIKE

Samuel Levinson, Briarcliff Manor, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 21, 1989, Ser. No. 326,585
Int. Cl.[5] G01S *13/40*
U.S. Cl. 342—200 **23 Claims**



1. A multi-frequency signal generator system producing a signal which is a comb of frequencies, comprising:

a reference oscillator having a signal output and producing a signal with a frequency "f";

a directional coupler having a first input connected to the output of said reference oscillator, said coupler having a first and a second output and a second, feedback input;

a frequency multiplier connected to said first output and having an output of its own; and

an amplifier connected to the output of said multiplier and having an output of its own, the amplifier output being connected to said feedback input of said directional coupler; said reference signal "f" being fed from said reference oscillator

through said directional coupler and

through said frequency multiplier and said amplifier and then fed back to said directional coupler, and

then back again through said multiplier and said amplifier and back to said directional coupler, producing at said second output of said directional coupler an output signal having a comb of frequencies including at least f+2f+3f.

4,983,979

RADAR DETECTION OF TARGETS AT SHORT AND LONG RANGE

Jennifer A. H. McKenzie, Ottawa, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Filed Mar. 28, 1989, Ser. No. 329,886
Int. Cl.[5] G01S *13/38*
U.S. Cl. 342—204 **7 Claims**

1. A pulse compression system, comprising:

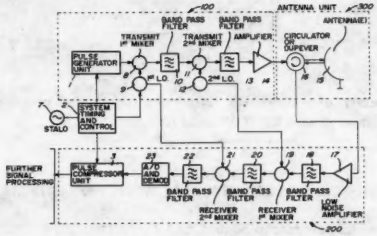
a transmitting channel including means for generating frequency or phase code modulated pulses having a centre frequency, and means for transforming said pulses to a desired transmitting frequency;

means for radiating said transformed frequency pulses and for receiving return signals; and

a single receiver channel means for processing said return signals, said receiver channel means comprising a single serially arranged bandpass filter means;

a pulse compression means, for compressing said return signals, following said single receiver channel means and being in series arrangement therewith;

wherein each said pulse to be transmitted comprises two sub pulses, one of said sub pulses being substantially longer than the other one of said sub pulses, each sub pulse being coded with a different compression code, the compression code of the one sub pulse code having a low correlation property with the compression code of the other sub pulse, both said sub pulses having the same centre frequency;



whereby said bandpass filter means has a bandpass sufficient to pass both said sub pulses;

said pulse compression means comprising two compressor units, one of said pulse compressor units having coefficients which correlate with said one of said sub pulses and hwich decorrelate with said other one of said sub pulses, the other one of said pulse compressor units having coefficients which correlate with said other one of said sub pulses and which decorrelate with said one of said sub pulses; and

means for switching said units into circuit one at a time, whereby, each unit is serially connected to said single receiver channel one at a time.

4,983,980

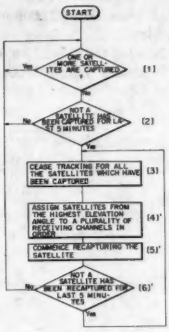
SATELLITE RADIO SIGNAL TRACKING METHOD FOR GPS RECEIVERS

Hitoshi Ando, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 549,514
Claims priority, application Japan, Nov. 2, 1989, 1-284820
Int. Cl.[5] G01S *1/00*
U.S. Cl. 342—357 **3 Claims**

1. In a GPS (Global Positioning System) receiver in which GPS signals from a plurality of GPS satellites are received sequentially through a receiving channel according to a time-division multiple-access system, a method of tracking the satellite signals for the GPS receiver comprising the steps of:

releasing the GPS receiver from time-division multiple-access reception when satellite signals from all the satellites in reception are lost simultaneously over a specified duration of time; and


START
ONE OR MORE SATELLITES ARE CAPTURED
Yes
No
[1]
NOT A SATELLITE HAS BEEN CAPTURED FOR LAST 5 MINUTES
[2]
CEASE TRACKING FOR ALL THE SATELLITES WHICH HAVE BEEN CAPTURED
[3]
ASSIGN SATELLITES FROM THE HIGHEST ELEVATION ANGLE TO A PLURALITY OF RECEIVING CHANNELS IN PARALLEL
[4]'
COMMENCE RECAPTURING THE SATELLITE
[5]'
NOT A SATELLITE HAS BEEN RECAPTURED FOR LAST 5 MINUTES
[6]'

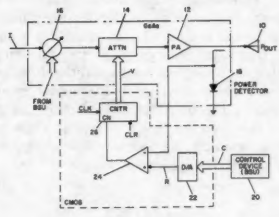
changing the receiving mode so as to track only one GPS satellite which is at the maximum estimated angle of elevation at that moment.

4,983,981

ACTIVE ARRAY ELEMENT AMPLITUDE STABILIZATION

Paul H. Feldman, Commack, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Feb. 24, 1989, Ser. No. 314,745
Int. Cl.[5] H01Q *3/00*; G01R *21/00*; H03C *1/62*
U.S. Cl. 342—372 **19 Claims**



1. An amplitude stabilization system for an antenna element, comprising;

amplifier means for supplying radio frequency (RF) energy to an antenna element;

power detector means for detecting the level of RF energy supplied to said antenna element, and for generating a corresponding power level signal;

control means for setting a reference signal corresponding to a desired value for the level of radiated RF energy;

comparing means, responsive to said power level signal and to said reference signal, for producing a first control signal when one of said power level and said reference signals is greater than the other;

a counter being responsive to said first control signal and to a supplied clock signal for generating a second control signal; and

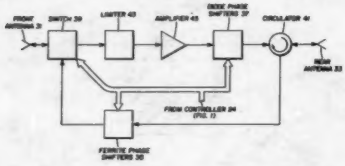
attenuator means, coupled to the input of said amplifier means and responsive to said second control signal, for maintaining the level of RF energy radiated by the antenna element at the desired value set by said control means.

4,983,982

SPACE FED PHASED ARRAY ANTENNA WITH DUAL PHASE SHIFTER

Raymond A. Roberge, Stow, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 16, 1989, Ser. No. 422,170
Int. Cl.[5] H01Q 3/00
U.S. Cl. 342—376 7 Claims



1. A radar system comprising:

(a) means for providing a radar operative to transmit radio frequency energy originating at a first feed and to receive radio frequency energy at a second feed; and

(b) a space fed array antenna including a plurality of antenna elements with each antenna element coupled to a first and a second radiating element with each element being responsive to radio frequency energy at said first and second feeds, each antenna element, comprising:

(i) a ferrite phase shifter adapted to shift the phase of radio frequency energy to be transmitted by an amount required to collimate and to direct such energy in a desired first direction;

(ii) a diode phase shifter adapted to shift the phase of received radio frequency energy to direct said received energy to the second feed;

(iii) amplifier means for amplifying received radio frequency energy to counteract, at least, the insertion losses of the diode phase shifter; and

(iv) means, for connecting the ferrite phase shifter between the first and second radiating elements when radio frequency energy is to be transmitted and for isolating the amplifier means and the diode phase shifter from the transmitted radio frequency energy, and for connecting the amplifier means and the diode phase shifter between the first and second radiating elements and for isolating the ferrite phase shifter from the received radio frequency energy.

4,983,983

SEMI-AUTOMATIC DIRECTION FINDING SET

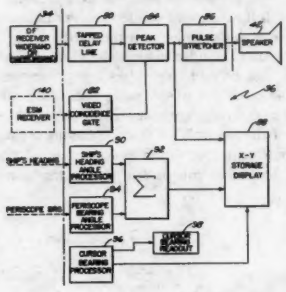
William P. Huntley, Old Lyme, and David J. Swanick, Salem, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1989, Ser. No. 446,262
Int. Cl.[5] G01S 3/14, 7/06
U.S. Cl. 342—443 4 Claims

1. A semi-automatic direction finding set comprising:

receiving means having a plurality of inputs for receiving directional RF signals from a corresponding plurality of directional RF antennas, one RF signal directed to one each of said plurality of inputs, said receiving means further comprising selecting means for selecting one of said plurality of directional RF antenna signals and amplitude demodulation means for amplitude demodulating said selected directional RF input signal; and

control indicating means having a first input means connected to said receiving means for receiving said selected amplitude demodulated directional RF input signal, said control indicating means further comprising a second input means for receiving an omnidirectional RF signal from an omnidirectional antenna, said control indicating means further comprising third and fourth input means for respectively receiving periscope bearing signals and ship's heading signals said control indicating means for processing and displaying the amplitude and direction of the



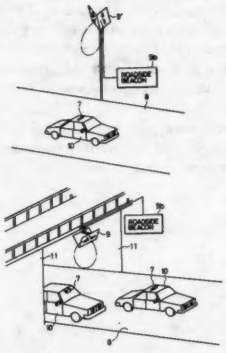
selected directional RF signal as a function of periscope rotation in bearing relative to true north.

4,983,984

ROADSIDE BEACON SYSTEM WITH POLARIZED BEAMS

Yoshizo Shibano; Haruo Suzuki, and Tohru Iwai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 25, 1987, Ser. No. 125,665
Claims priority, application Japan, Nov. 27, 1986, 61-282631
Int. Cl.[5] H01Q 1/32
U.S. Cl. 343—711 2 Claims



1. A roadside beacon system comprising a plurality of roadside radio-wave antennas for transmitting signals and installed along roads and a plurality of mobile radio-wave antennas mounted on respective vehicles traveling on said roads for receiving said signals,

wherein at least one roadside antenna, at a position where a structure is extended over a road, is mounted on a lower portion of said structure to transmit and receive in a downward direction a radio wave polarized in a widthwise direction of said road, and at least one roadside antenna is installed near said road to transmit and receive a vertically polarized radio wave in an obliquely downward direction, and

wherein each mobile antenna mounted on a vehicle transmits and receives a horizontally polarized radio wave in a direction of travel of said vehicle, a vertically polarized radio wave in a direction perpendicular to the direction of

travel of said vehicle, and a radio wave polarized in the widthwise direction of said vehicle in an upward direction of said vehicle.

4,983,985

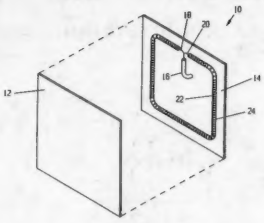
CELLULAR ANTENNA

Steve Beatty, 3750 Texas Ave., St. Louis Park, Minn. 55426

Filed Feb. 21, 1989, Ser. No. 312,728

Int. Cl.[5] H01Q *1/40, 7/00*

U.S. Cl. 343—741 **1 Claim**



1. Cellular antenna for 850 MHZ cellular telephone transceiver operation comprising:

a. a substantially rectangular configuration of copper braid full wave loop of approximately 8 cm by 10 cm with an electrical connection at an off center point of said rectangular configuration between ends of said braid;

b. a back panel supporting said copper braid;

c. a coaxial feed line transformer of approximately 6 cm in length with a 90 degree bend in a center portion of said length thereof electrically connected at one end to said ends of said braid at said off center point of a long leg of said rectangular configuration of said copper braid with a male UHF connector at an other end; and,

d. front panel of the same size of said back panel encompassing said rectangular configuration of said copper braid whereby said coaxial feedline transformer matches said antenna to said cellular telephone transceiver.

4,983,986

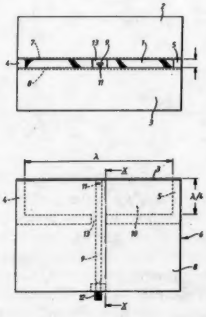
SLOT ANTENNA

Edmund W. Woloszczuk, Essex, United Kingdom, assignor to The General Electric Company, p.l.c., London, United Kingdom

Filed Dec. 20, 1988, Ser. No. 286,845

Int. Cl.[5] H01Q *13/100, 1/420*

U.S. Cl. 343—771 **7 Claims**



1. A three conductor fed slot antenna, comprising:

two ground planes defining a slot therebetween;

two conductive elements electrically connected to the ground planes and spaced apart between said ground planes to define a length of λ of said slot, where λ is the wavelength of a signal intended to be radiated from or received by said antenna, said two conductive elements defining end walls of a resonant cavity backing the slot; and

a three conductor feed structure coupled for feeding the slot and including two outer conductors each connected to a respective one of the ground planes and an inner conductor centrally disposed in the cavity.

4,983,987

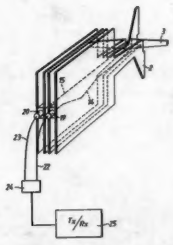
ANTENNA

Edmund W. Woloszczuk, Essex, United Kingdom, assignor to The General Electric Company, p.l.c., London, United Kingdom

Filed Dec. 20, 1988, Ser. No. 286,844

Int. Cl.[5] H01Q *21/24*

U.S. Cl. 343—797 **5 Claims**



1. An antenna comprising:

a pair of crossed dipoles, each dipole having a center axis and a pair of dipole arms disposed about its center axis, the pair of crossed dipoles being arranged such that the center axes are separated by a distance less than the length of the dipole arm;

two three conductor feed structures, each feed structure being connected to a respective one of said pair of dipoles and having two outer conductors and a central conductor, the central conductor extending along the center axis of the respective dipole;

wherein each arm of said pair of dipole arms of each dipole is formed from an extension of one of the two outer conductors of the feed structure connected to the respective dipole and one arm of each dipole is electrically connected to the central conductor of the feed structure connected to the respective dipole.

4,983,988

ANTENNA WITH ENHANCED GAIN

Ernest A. Franke, Largo, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 21, 1988, Ser. No. 273,562

Int. Cl.[5] H01Q *21/00*

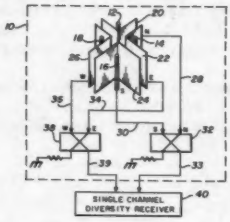
U.S. Cl. 343—853 **6 Claims**

1. An antenna system having enhanced gain comprising:

at least N directional antenna combining to cover a 360° horizontal beamwidth sector and having an established vertical beamwidth, each individual antenna including an omni-directional antenna and a reflector element to limit the horizontal beamwidth of the associated omni-directional antenna to cover no more than a 360°/N beamwidth sector where N=an even number ≧2;

a power combiner hybrid coupled to each opposed pair of

antennae for combining the signals from the opposed antennae; and



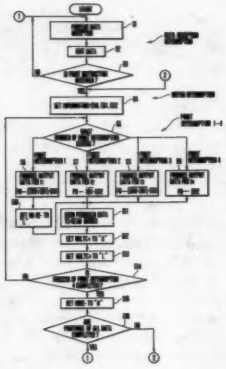
a single channel diversity receiver coupled to the power combiner hybrids for adjusting the phase and amplitude of the signal from each combiner hybrid for constructively combining the signals.

4,983,989

PRINTING CONTROL SYSTEM FOR THERMAL PRINTER

Sintaro Komuro; Yasushi Nitta, and Ryuichi Hatanaka, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 112,930
Claims priority, application Japan, Oct. 30, 1986, 61-256892
Int. Cl.[5] G01D *9/00*
U.S. Cl. 346—1.1 **5 Claims**



1. A method of controlling printing in a thermal printer, the method being adapted to control a printing density of a dot corresponding to each of a plurality of heating resistor elements by controlling energization times of the plurality of heating resistor elements, wherein dot energization times of a heating resistor element corresponding to a printing dot to be printed in a line at a current step are determined on the basis of a printing data printed in the same line at least one and two printing dots ahead of the current printing dot.

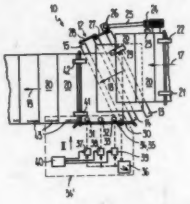
3. A printing control apparatus in a thermal printer, comprising a recording head having a plurality of heating resistor elements, processor means for preparing and storing data sent from a host computer and calculating and outputting current printing data to be printed in a line on the basis of printing data printed in the same line at least one and two printing dots ahead of a current printing dot, means for parallel/serial converting output data from said processor means, and head driver means for generating an ON/OFF pulse signal for heating resistor elements of said recording head on the basis of output data from said parallel/serial converting means.

4,983,990

METHOD AND APPARATUS FOR INDIVIDUALLY INSCRIBING PRINTED PRODUCTS IN AN IMBRICATED STREAM

Beat Fröhlich, Oberdürnten, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jun. 5, 1989, Ser. No. 361,502
Claims priority, application Switzerland, Jun. 16, 1988, 02327/88
Int. Cl.[5] G01D *15/18*; B65H *9/16*
U.S. Cl. 346—1.1 **13 Claims**



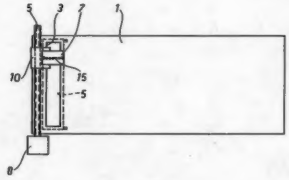
1. An apparatus for individually inscribing printed products (20) in an imbricated stream S, comprising an ink jet writer (34'), product conveying means (11, 12, 16) for directing the printed products past the ink jet writer (34'), a sensor (34, 35) for triggering a writing operation when a printed product (20) reaches the writing area of the ink jet writer (34'), said product conveying means including means (12) adjacent the ink jet writer (34') for laterally displacing the printed products individually during the transportation of the printed products (20) in the imbricated stream and so as to serially expose the side margins of the products and position each exposed side margin at said writing area of the ink jet writer.

4,983,991

METHOD AND APPARATUS FOR MARKING A FILM IN AN X-RAY APPARATUS

Juhani Palonen, Espoo, Finland, assignor to Instrumentarium Corp., Finland

Filed Jan. 29, 1990, Ser. No. 471,911
Claims priority, application Finland, Nov. 14, 1989, 895411
Int. Cl.[5] G01D *9/00*; G03C *1/76*; G03B *27/52*
U.S. Cl. 346—33 ME **11 Claims**



1. A method for recording patient related information and other data in connection with X-ray imaging, comprising the steps of mounting an X-ray film in a cassette having an elongated slot, inserting marking means having a plurality of marking elements through the slot and into contact with said film, moving the marking means and the film relative to each other, individually effecting operation of said marking elements to provide a pattern of marks on said film, and blocking the passage of light through said slot into the cassette and onto the film.

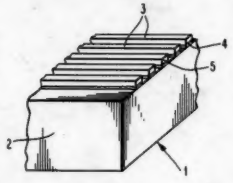
4. An apparatus for recording patient related information and other data in connection with X-ray imaging, comprising a cassette to contain an X-ray film and having an elongated slot, a slide extending through said slot, marking means carried by the slide, drive means for effecting relative movement between the slide and the cassette to move the marking means relative to said film, means for bringing said marking means into contact with the film for marking said film, and means for blocking passage of light through the slot onto the film.

4,983,992

PRINTING HEAD FOR RESISTIVE RIBBON TYPE PRINTING APPARATUS

Ribun Nakazawa, Tokyo, Japan, assignor to Teikoku Piston Ring Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1989, Ser. No. 369,081
Int. Cl.[5] G01D *15/10*; H05B *3/00*
U.S. Cl. 346—76 PH 7 Claims



1. A printing head for a resistive ribbon type printing apparatus, which printing head comprises an insulating substrate and a plurality of printing electrodes formed on the substrate, characterized in that each of said printing electrodes is made of a patterned electroless-plating thin layer and an electroplating material formed on the electroless-plating thin layer and said substrate is made of a nonporous machinable ceramic having a hardness not higher than a hardness of said electroplating material.

4,983,993

THERMAL RECORDING HEAD

Masao Sugata, Yokohama; Tatsuo Masaki, deceased, late of Yokohama (by Yoshiko Masaki, legal successor); Hirokazu Komuro; Shinichi Hirasawa, both of Hiratsuka, and Yasuhiro Yano, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 842,242, Mar. 21, 1986, abandoned. This application Oct. 7, 1988, Ser. No. 256,081
Claims priority, application Japan, Mar. 25, 1985, 60-58529; Mar. 26, 1985, 60-59388; Mar. 26, 1985, 60-59389; Mar. 26, 1985, 60-59390; Mar. 26, 1985, 60-59391; Mar. 27, 1985, 60-60535; Mar. 27, 1985, 60-60536; Mar. 27, 1985, 60-60537; Mar. 27, 1985, 60-60538; Mar. 28, 1985, 60-62085
Int. Cl.[5] G01D *15/10*; H05B *1/00*; H01C *1/012*; B32B *9/00*
U.S. Cl. 346—76 PH 53 Claims

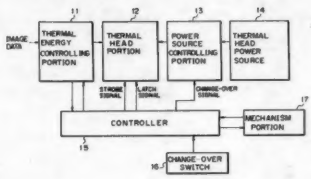
1. A thermal recording head comprising a substrate and at least one set of a heat-generating resistance layer and at least one pair of electrodes connected to said heat-generating resistance layer, said set being formed on said substrate, wherein said heat-generating resistance layer comprises an amorphous material containing halogen atoms and hydrogen atoms in a matrix of carbon atoms, wherein at least one of halogen atoms and hydrogen atoms are distributed nonuniformly everywhere throughout the film thickness direction in said amorphous material.

4,983,994

THERMAL TRANSFER TYPE PRINTING DEVICE

Takashi Mori, Tokyo, and Eiichi Sasaki, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,797
Claims priority, application Japan, Sep. 26, 1988, 63-124670[U]; Apr. 27, 1989, 1-105884
Int. Cl.[5] G01D *15/10*; B41J *2/315*
U.S. Cl. 346—76 PH 26 Claims



1. A thermal transfer type printing device for printing on a recording medium selectively suitable for use in transmission type overhead projectors and in reflection type overhead projectors, comprising:

thermal print head means for printing an image on a recording medium;

first change-over means for selecting between use of a recording medium in a transmission type overhead projector and use of the recording medium in a reflection type overhead projector and for generating a first change-over signal related to the selected use of the recording medium;

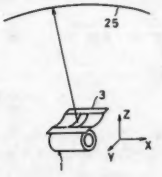
control means coupled to said thermal print head means and responsive to said first change-over signal for controlling the print head to cause the print head to print an image on said recording medium at an image density related to said selected use of the recording medium.

4,983,995

EXPOSURE DEVICE FOR FORMING PHOSPHOR DEPOSITED SCREEN IN IN-LINE CATHODE RAY TUBE

Takashi Sugahara, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,089
Claims priority, application Japan, Apr. 13, 1988, 63-92163
Int. Cl.[5] G03B *41/00*
U.S. Cl. 354—1 10 Claims



1. An in-line cathode ray tube apparatus utilizing a finely perforated shadow mask, comprising:

a highly evacuated envelope having a longitudinal axis and a funnel section being closed at one end by a generally cylindrical neck section including an inline electron gun

assembly and being closed at an opposite end to said one end by a fireplace;

an exposure device for forming a mosaic pattern of element color emissive phosphor dots on a screen area of said faceplate, said exposure device including a generally elongated light source and a slitted member disposed between said elongated light source and said faceplate of said evacuated envelope;

a slit-shaped light transmissive area defined in said slitted member, said light transmissive area having a generally intermediate portion and opposite end being displaced in a direction parallel to said longitudinal axis of said evacuated envelope, wherein said intermediate portion is located closer to said elongated light source than said opposite ends thereof; and

a light intercepting area formed around said light transmissive area.

4,983,996

DATA RECORDING APPARATUS FOR STILL CAMERA

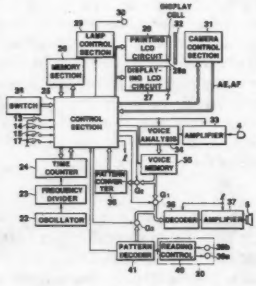
Satoshi Kinoshita, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 400,567, Aug. 30, 1989, abandoned. This application May 22, 1990, Ser. No. 527,705

Claims priority, application Japan, Sep. 2, 1988, 63-115649[U]

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—76 **17 Claims**



1. A data recording apparatus for a still camera, comprising:

an optical lens;

photosensitive material onto which an object image guided through said optical lens is recorded;

voice input means;

voice converter means for converting a voice input from said voice input means into digital data;

pattern converter means for converting the digital data converted by said voice converter means into corresponding bar code data;

printing means for transferring a pattern image of the bar code data onto said photosensitive material, said bar code data converted by said pattern converter means;

optical reading means for reading a pattern image recorded on a printing paper;

converter means for converting the pattern image read by said optical reading means into voice data; and

audio means for converting the voice data converted by said converter means into a voice and for audibly outputting said voice.

4,983,997

MICROPHOTOGRAPHIC APPARATUS WITH AUTOMATIC FILM FORMAT REFLECTION

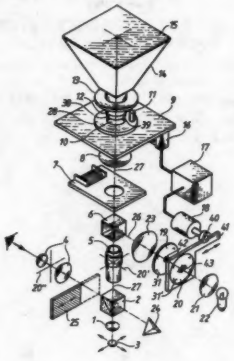
Winfried Kraft, Asslar-Werdorf, Fed. Rep. of Germany, assignor to Wild Leitz GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 407,944

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 8811737

Int. Cl.[5] G03B *17/48*

U.S. Cl. 354—79 **15 Claims**



1. A microphotographic apparatus, comprising:

a. a light source;

b. a first carrier positioned along the path of light from said light source which has multiple sets of markings on it;

c. a second carrier positioned along the path of light from said light source which has multiple sets of markings on it;

d. at least one camera attachment which holds at least one film format; and

e. a control apparatus coupled to said first carrier and coupled to said camera attachment, wherein said control apparatus moves said first carrier in response to the film format present in said camera attachment.

4,983,998

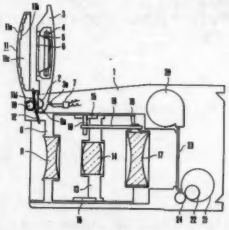
FLASH DEVICE FOR CAMERA

Michio Hirohata; Kazuo Ikawa, both of Kanagawa, and Kiyoshi Ikuta, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1989, Ser. No. 452,596

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—149.1 **17 Claims**



1. A flash device for camera, or a camera, comprising:

(A) light emitting means for flash photography, said light emitting means being located on a camera body; and

(B) light distributing means for varying a light distribution

characteristic of said light emitting means, said light distributing means being located on a photographic lens barrel which moves as a focal length of a photographic optical system varies, and being arranged to vary the light distribution characteristic of said light emitting means in accordance with the focal length of said photographic optical system.

4,983,999

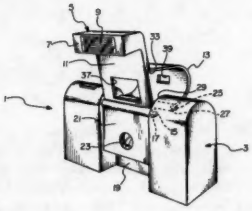
CAMERA WITH FLIP-UP FLASH UNIT

William J. Meisezahl; David J. Glogan, both of Rochester, and William L. Burnham, Leroy, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1990, Ser. No. 478,909

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—149.11 **5 Claims**



1. A photographic camera comprising (a) a camera housing and (b) a flip-up flash unit including a head part having a flash emission window and a pair of supporting parts for said head part pivotally connected to said camera housing to permit swinging movement of said flash unit to a folded storage position in which the head part and said supporting parts cover respective portions of the camera housing and to a non-folded operative position in which the head part and the supporting parts are elevated from the camera housing with said flash emission window substantially facing a subject to be photographed and with one of the supporting parts located behind the other one to brace the first one, is characterized in that:

said supporting part that is located behind the other one when said flash unit is in the non-folded position is resiliently flexible and is pivotally connected to the other one to be constrained to operate as an overcenter spring to urge the flash unit alternatively to the non-folded and folded positions.

4,984,000

LENS DRIVING APPARATUS FOR A CAMERA

Youji Watanabe, Sagamihara; Yoshiaki Kobayashi, Nagano, and Kazuhiro Satoh, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1989, Ser. No. 431,747

Claims priority, application Japan, Nov. 11, 1988, 63-285518

Int. Cl.[5] G03B *3/10*

U.S. Cl. 354—195.1 **22 Claims**

1. A lens driving apparatus comprising:

a manually operable operation member for indicating driving of a lens;

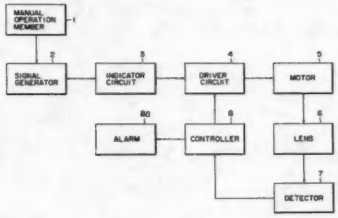
direction detecting means for detecting an operational direction of said operation member and generating an operational direction signal;

means for driving the lens;

drive detecting means for detecting driving of the lens and generating a drive pulse;

pressing detecting means for detecting that the lens has reached one of ends of a drivable range of the lens based on the drive pulse and detecting the lens being pressed against said one end when the operational direction signal indicates further driving of the lens in a direction to go over said one end;

means for inhibiting the lens from being driven in said direction toward said one end upon detection of pressing of the lens; and



alarm means for varying a resistive force of said operation member when operated at a time pressing of the lens is detected, thereby alarming that the lens is pressed against said one end.

4,984,001

FOCAL LENGTH DISPLAY DEVICE OF CAMERA

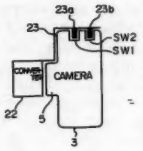
Keiji Himuro, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,834

Claims priority, application Japan, May 13, 1989, 1-55194[U]; Sep. 11, 1989, 1-106354[U]

Int. Cl.[5] G03B *3/00*

U.S. Cl. 354—195.12 **3 Claims**



1. A focal length display device of a camera comprising:

a zoom lens unit which comprises a group of lenses disposed on a same optical axis;

a drive means for driving said group of lenses of said zoom lens unit;

a lens position detection means which detects a position of said group of lenses and outputs a signal of information data on said position of the lens group;

an information signal converter means for converting said information data signal to a digital signal;

a converter detection means for detecting a state whether an optical converter having a magnification is attached to said zoom lens unit;

a focal length calculation means for calculating the focal length in such a way that, when said converter detection means detects the state in which said optical converter is not attached to said zoom lens unit, the focal length is calculated in response to said digital signal from said information signal converter means, while when said converter detection means detects the state in which said optical converter is attached to said zoom lens unit, the focal length is calculated in response to said digital signal from said information signal converter means and said magnification of said optical converter; and

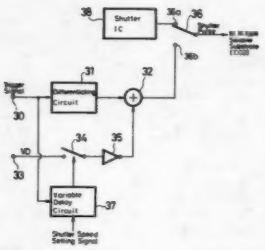
a display means for displaying said focal length calculated by said calculation means.

4,984,002

VIDEO CAMERA SHUTTER CONTROL BY CHARGE ACCUMULATION TIME OF CCD IMAGES

Yuji Kokubo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 8, 1990, Ser. No. 461,926
Claims priority, application Japan, Jan. 12, 1989, 64-005269
Int. Cl.[5] A04N 3/15, 5/335
U.S. Cl. 358—213.13 5 Claims



1. An electronic shutter for a charge-coupled imager comprising:

(a) a charge-coupled imager of inter-line transfer type including charge accumulating region for accumulating charge corresponding to an incident light, a drain region, control means for controlling the discharge of said accumulated charge to said drain region, and read-out means for reading out said accumulated charge and for generating a video signal corresponding to said accumulated charge;

(b) a trigger signal input terminal supplied with a trigger signal;

(c) a shutter speed setting data input terminal supplied with shutter speed setting data; and

(d) timing signal generator means supplied with said trigger signal and said shutter speed setting data and for generating a timing signal supplied to said charge-coupled imager such that said charge accumulation starts in synchronism with said trigger signal and lasts during the time determined by said shutter speed setting data.

4,984,003

DEVICE FOR OPENING AND CLOSING SHUTTER BLADE WITHOUT BOUNCE

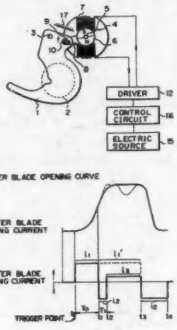
Jun-ichi Matsumoto, Warabi; Toyonori Sasaki, Tokyo, and Kiyoshi Touma, Tokorozawa, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Jul. 20, 1989, Ser. No. 382,187
Claims priority, application Japan, Jul. 22, 1988, 63-97108; Jul. 22, 1988, 63-97107; Jul. 26, 1988, 63-98777
Int. Cl.[5] G03B 9/08
U.S. Cl. 354—235.1 7 Claims

3. In a device for opening and closing shutter blade(s) of a shutter in a photographic camera having an electromagnetic actuator of a rotary magnetic type including a rotatable permanent magnet rotor operatively coupled with said shutter blade(s) and a stationary coil surrounding said rotor and electromagnetically cooperating therewith, said rotor being adapted to be rotated in one direction when a current is applied in one direction to said stationary coil from an electrical source through a driver, while said rotor is rotated in an opposite direction when a current is applied to said stationary coil in an opposite direction, thereby permitting said shutter blade(s) to be opened and closed depending upon the direction of the current applied to said stationary coil for achieving the exposure of said camera, wherein:

stop means are provided for abutting against at least one of said shutter blade(s) at a fully opened position thereof;

said control circuit supplies a shutter opening current to said stationary coil during a time point from a trigger point at which the opening of said shutter blade(s) is to be commenced until a time point a predetermined time period prior to the fully opened position of said shutter blade(s) abutting against said stop means and,



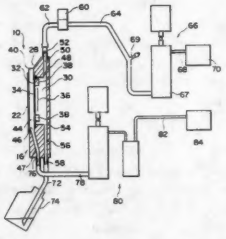
thereafter, said control circuit supplies a shutter closing current to said stationary coil for a predetermined time period for braking the opening movement of said shutter blade(s) so that an impact of said shutter blade(s) against said stopper means at the fully opened position of said shutter blades(s) is reduced to avoid a bounce thereof.

4,984,004

DEVELOPING APPARATUS

Akira Yoda; Yoshimitu Sato, and Takao Ozaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1989, Ser. No. 413,508
Claims priority, application Japan, Sep. 28, 1988, 63-243318; Sep. 28, 1988, 63-243319; Sep. 28, 1988, 63-243320
Int. Cl.[5] G03D 5/00
U.S. Cl. 354—317 20 Claims



1. A developing apparatus for developing a developing area of a light-sensitive material by supplying a developing solution thereto, comprising:

a multiple-hole plate in which a plurality of small holes are formed in correspondence with said developing area of said light-sensitive material;

a pressurizing chamber which is provided on the side of said multiple plate which is remote from the side where said light-sensitive material is provided, a part of said pressurizing chamber being defined by said multiple-hole plate;

supplying means for supplying the developing solution to said pressurizing chamber; and

pressurizing means for periodically pressurizing the developing solution in said pressurizing chamber so as to cause

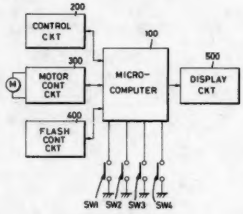
the developing solution to be jetted and supplied to said developing area in the form of droplets via said small holes.

4,984,005

PHOTOGRAPHING MODE SWITCHING DEVICE OF A CAMERA

Kazuyuki Kazami; Toshiyuki Nakamura, both of Tokyo, and Hiroshi Wakabayashi, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 197,148, May 23, 1988, abandoned. This application Apr. 25, 1990, Ser. No. 513,027
Claims priority, application Japan, Jun. 3, 1987, 62-139584
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—412 **9 Claims**



1. A camera comprising:

first selection means for selecting any one of a plurality of selectable control modes;

photographing means for executing photography in accordance with the control mode selected by said first selection means; and

second selection means for selecting any one of a plurality of selectable exposure modes, including a first exposure mode in which the control mode selected by said first selection means is automatically changed to another of said control modes in response to completion of photography executed by said photographing means and a second exposure mode in which the control mode selected by said first selection means is continued after completion of photography executed by said photographing means.

4,984,006

BRIGHTNESS MEASURING APPARATUS FOR PROVIDING ADEQUATE OBJECT BRIGHTNESS AND A FLASHLIGHT EMISSION APPARATUS PROVIDING ADEQUATE EXPOSURE, IRRESPECTIVE OF PHOTOGRAPHING CONDITIONS

Masayuki Ikemura; Takehiko Karasaki; Manabu Inoue; Takehiro Katoh; Yasuteru Yamano, and Koji Hata, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 429,504, Oct. 31, 1989, abandoned, which is a division of Ser. No. 352,502, May 16, 1989, abandoned. This application Apr. 18, 1990, Ser. No. 512,522
Claims priority, application Japan, May 16, 1988, 63-118620; May 16, 1988, 63-118621
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—414 **1 Claim**

1. An apparatus for flash photography, comprising:

first measuring means for measuring a brightness of a main object located in approximate center of a scene;

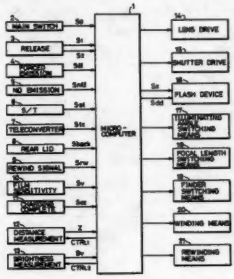
second measuring means for measuring a brightness of a background situated in a peripheral part of said scene;

rear light judging means for judging whether or not said main object is under rear light condition on the basis of the outputs of said first and second measuring means;

flashlight emission means for emitting a flashlight;

selection means for selecting a forced emission mode in which a photographing operation is performed with the flashlight emission irrespective of the brightness of said main object and that of said background;

exposure control value calculation means for calculating an exposure control value so that the peripheral part of said scene is overexposed by a first predetermined amount when said rear light judging means judges that said main object is under rear light condition, and for calculating an exposure control value so that the main object is underexposed by a second predetermined amount when said rear



light judging means judges that said main object is not under rear light condition and said selection means selects said forced emission mode;

exposure control means for controlling an exposure amount on the basis of the exposure control value calculated by said exposure control value calculation means; and

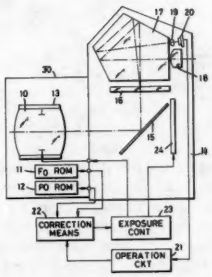
emission control means for actuating said flashlight emission means when said rear light judging means judges that said main object is under rear light condition, or when said selection means selects the forced emission mode.

4,984,007

EXPOSURE CONTROL APPARATUS FOR CAMERA

Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,748
Claims priority, application Japan, Oct. 23, 1987, 62-267968
Int. Cl.[5] G03B *7/08, 7/099*
U.S. Cl. 354—432 **9 Claims**



1. A camera body to which a photographing lens storing data associated with a full-aperture value and data associated with a position of an exit pupil can be attached, including:

(a) an optical member for scattering radiation from said photographing lens, said optical member being arranged on a side opposite to an object with respect to said photographing lens;

(b) light-receiving means;

(c) a photometric optical system for guiding the radiation from said photographing lens through said optical member toward said light-receiving means, said light-receiving means generating an output according to the radiation incident from said photometric optical system;

(d) correction means for reading out the data associated with the full-aperture value and the position of the exit pupil, calculating a correction amount based on the readout data, and correcting the output from said light-receiving means based on the calculated correction amount; and

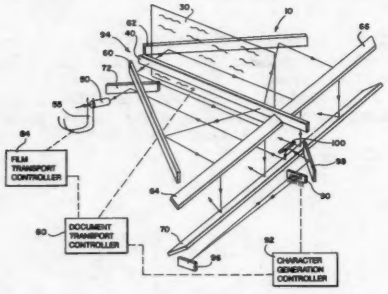
(e) exposure control means for performing exposure control based on the corrected output.

4,984,008

FILM NUMBER WRITING SYSTEM

Richard Frystak, Park Ridge, and John S. O'Callaghan, Sr., Wilmette, both of Ill., assignors to Bell & Howell Company, Skokie, Ill.

Filed Apr. 28, 1989, Ser. No. 344,996
Int. Cl.[5] G03B 27/52
U.S. Cl. 355—24 19 Claims



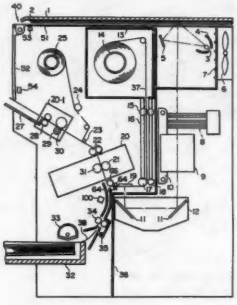
1. A microfilming system, comprising: means for moving a document through an imaging region, means for simultaneously moving film through an exposure region, a display device for generating a character image, and optical means for projecting an image of one side of said document in said imaging region to a document portion of said exposure region and for projecting said character image of said display device to a character portion of said exposure region which is disposed along one side of said document portion of said exposure region, wherein said optical means comprises document image projecting means for projecting said image of said document portion, separate character image projecting means for projecting said character image, and image combining means for combining images projected by said document image projecting means and said separate character image projecting means and projecting a combined image to said exposure region.

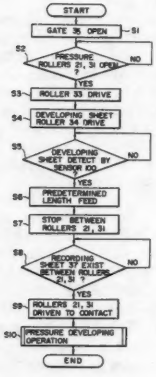
4,984,009

IMAGING DEVICE HAVING MEANS TO ACCURATELY SUPERPOSE SHEETS IN THE DEVELOPING PROCESS

Kazumasa Makino, Nagoya; Hideo Yoshihara, Kasugai; Michitoshi Akao, Nagoya; Kenji Sakakibara, Ichinomiya; Takeshi Izaki, Nagoya; Tokunori Katoh, Ichinomiya; Hiroshi Morisaki, Nishikasugai; Masanari Kobayashi, and Shin Asai, both of Ichinomiya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 18, 1989, Ser. No. 424,081
Claims priority, application Japan, Oct. 19, 1988, 63-263315; Oct. 31, 1988, 63-275701; Jan. 30, 1989, 1-20507; Jan. 31, 1989, 1-20508; Jan. 31, 1989, 1-20509; Jan. 31, 1989, 1-22926
Int. Cl.[5] G03B 27/52
U.S. Cl. 355—27 12 Claims





1. An imaging device utilizing a continuous-form recording sheet coated with a plurality of photo and pressure sensitive microcapsules each containing dye precursor and a cutform developing sheet, to be superposed with said recording sheet, coated with a developer material being reactable with the dye precursor, which comprises:

means for exposing a latent image corresponding to an image of an original on said recording sheet;

a pair of pressure-developing rollers, adapted to be brought into and out of contact with each other, for pressurizing said recording sheet exposed by said exposing means to develop a visible image;

first travel means for causing said recording sheet to travel at least from said expose means to said pair of pressure-developing rollers;

second travel means for causing said developing sheet to travel to said pair of pressure developing rollers; and

control means for controlling said pressure-developing rollers and said first and second travel means so as to begin to pressurize said recording sheet and said developing sheet in case said recording sheet and said developing sheet have traveled to a predetermined positional relationship with said pair of pressure-developing rollers wherein a leading edge of said developing sheet and a predetermined portion of said recording sheet corresponding to said leading edge are overlapped with each other at a predetermined position of a travel path along which said recording sheet has travelled located after the position at which said pair of pressure-developing rollers are brought into contact with each other and said control means controls said second travel means so as not to cause said developing sheet to travel in case that said pair of pressure-developing rollers are brought into contact with each other.

4,984,010

IMAGE RECORDING APPARATUS

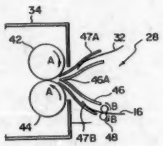
Hiroshi Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 102,206, Sep. 29, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,355

Claims priority, application Japan, Sep. 29, 1986, 61-230822

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **17 Claims**



1. An image recording apparatus in which a light-sensitive photographic material having at least one emulsion coated surface and an image-receiving material having at least one emulsion coated surface are superposed to have their respective emulsion brought into close contact with each other so that an image on said light-sensitive photographic material is transferred to said image-receiving material at a heat developing/transferring section, the image recording apparatus comprising:

superimposing means for superposing said light-sensitive photographic material and said image-receiving material and bringing them into close contact with each other, disposed upstream of the immediately adjacent to said heat-developing/transferring section;

back tension imparting means for imparting back tension to both of said light-sensitive photographic material and said image receiving material, said back tension means comprising for each material a pair of tension rollers disposed upstream of said superimposing means and rotating at a slower speed than said material; and

guide means for guiding said light-sensitive photographic material and said image-receiving material in such a manner that the emulsion coated surface of said material are kept away from each other so as to prevent said light-sensitive photographic material and said image-receiving material from unexpectedly gradually developing until they are deliberately brought into contact by said superimposing means prior to being heated at said heat-developing/transferring section as they are fed in a common direction,

wherein said guide means is disposed upstream of and directly adjacent to said superposing means in a direction opposite a direction in which said light-sensitive photographic material and said image-receiving material are fed.

4,984,011

IMAGE RECORDING APPARATUS

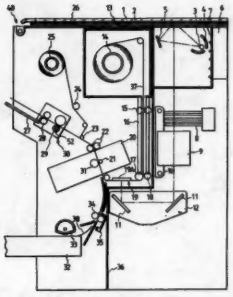
Kenji Sakakibara, Ichinomiya; Michitoshi Akao, Nagoya; Tokunori Katoh, Ichinomiya, and Yukichi Sawaki, Gifu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 31, 1989, Ser. No. 359,690

Claims priority, application Japan, Jun. 3, 1988, 63-138071

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **5 Claims**



1. An image recording apparatus for recording an image corresponding to an original on a recording medium, said recording medium including a photosensitive recording medium and an image forming sheet, said apparatus comprising;

a light source for irradiating a light on said original;

optical means for directing the reflected light reflected from said original or the transmitted light passing through said original to said photosensitive recording medium;

scanning means for moving said light source and optical means, and said original relatively to each other during exposure;

moving means for moving said photosensitive recording medium during exposure;

transferring means for transferring an image on said photosensitive recording medium to said image forming sheet;

thermal fixing means for fixing said transferred image on said image forming sheet;

temperature detecting means for detecting temperature of said thermal fixing means;

first control means for controlling the quantity of current to be supplied to said light source in accordance with the quantity of current to be supplied to said thermal fixing means; and,

second control means for controlling speeds of said scanning means and said moving means in accordance with the quantity of light of said light source controlled by said first control means.

4,984,012

COLOR IMAGE COPYING APPARATUS

Akihiro Sawada, Nagoya, and Hideo Yoshihara, Kasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 20, 1988, Ser. No. 260,034

Claims priority, application Japan, Oct. 23, 1987, 62-268680; Oct. 23, 1987, 62-162974[U]

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 **18 Claims**

1. A color image copying apparatus for forming an image on a photosensitive recording medium having sensitivities, said

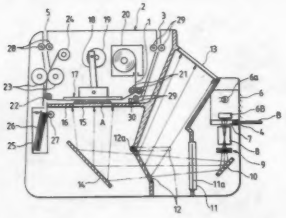
image corresponding to an original image of an original, comprising:

an exposure unit having an exposure stand along which said photosensitive recording medium is travelled;

a light source;

a projector lens for projecting light from said light source onto said photosensitive recording medium fed onto said exposure stand;

a color light control filter unit movably disposed at a light path extending from said light source to said exposure stand, said color light control filter unit having a plurality of filters for selectively allowing specific light to pass therethrough in accordance with said sensitivity of said photosensitive recording medium, said plurality of filters



comprising a plurality of chromatic resolution filters movable independently and in combination in and out of said light path; and

control means connected to said filter unit for moving at least one of said filters toward and away from said light path;

wherein said original is at least one of a first original installable on said exposure stand, a second original on which a mask image is formed, and a third original comprising a positive color film, said color image forming apparaus further comprising positioning means for positioning said first original or said second original between said exposure stand and said photosensitive recording medium at said exposure unit and for positioning said third original between said light source and said projector lens.

4,984,013

METHOD FOR CONTROLLING EXPOSURE AMOUNT IN COPYING OF COLOR ORIGINALS

Takaaki Terashita, Ashigarakami, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 343,710, Apr. 27, 1989, abandoned. This application Apr. 17, 1990, Ser. No. 511,810

Claims priority, application Japan, Apr. 28, 1988, 63-107105; May 13, 1988, 63-117199; May 13, 1988, 63-117200; May 19, 1988, 63-122762; May 19, 1988, 63-122763

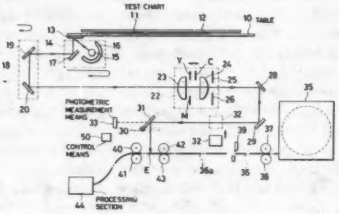
Int. Cl.[5] G03B *27/80*

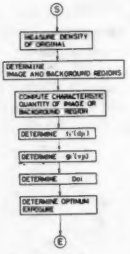
U.S. Cl. 355—38 **11 Claims**

1. A method for controlling an exposure amount in copying of a color original, comprising the steps of:

(a) photometrically measuring a color density or another value corresponding thereto on the surface of the original from its reflected image,

(b) determining whether or not the difference in color density between two positionally different spots exceeds a predetermined value, thereby determining first spots having a larger color density difference as belonging to an image region and second spots having a lesser color density difference as belonging to a background region, and extracting at least one of the regions without operator intervention, and





(c) determining an exposure amount for subsequent copying based on a characteristic quantity of the extracted region.

4,984,014

REPRODUCTION CAMERA COMPRISING A SCANNING LIGHT SOURCE

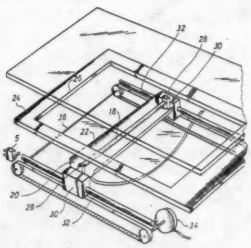
Finn Hougaard, Copenhagen, Denmark, assignor to Eskofot A/S, Ballerup, Denmark

Filed Dec. 13, 1989, Ser. No. 450,075

Claims priority, application Denmark, Dec. 16, 1988, 7000/88

Int. Cl.[5] G03B *27/54*

U.S. Cl. 355—67 **9 Claims**

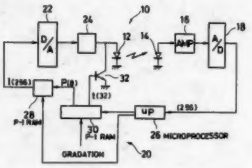


1. A reproduction camera comprising a picture plane, an original plane and an objective plane, whereby the original plane is exposed by means of at least one elongated scanning light source preferably situated below said original plane and optionally scanning at a varying velocity, wherein the light source is turned during the scanning procedure in such a manner that it is directed towards the objective.

4,984,015
EXPOSURE METHOD AND APPARATUS

Yoshiharu Okino, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 324,782
Claims priority, application Japan, Mar. 17, 1988, 63-64100
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—68 **16 Claims**



1. A method for exposing a photosensitive material to light from a light source in a desired total exposure corresponding to the image density of each picture element, comprising the steps of:

determining the total exposure as sets of exposure parameters, each set comprising one of a plurality of light output modulation steps selected from the light output of the light source under predetermined conditions and one of a plurality of exposure time modulation steps,

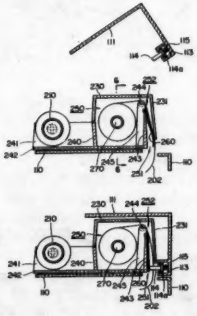
selecting a set corresponding to the maximum exposure time modulation step among said sets as exposure parameters, and

exposing the photosensitive material in accordance with said exposure parameters to achieve the desired total exposure.

4,984,016
CASSETTE FOR PHOTO-SENSITIVE RECORDING MEDIUM

Kazumasa Makino, Nagoya, and Yumio Matsumoto, Kasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 16, 1989, Ser. No. 352,753
Claims priority, application Japan, May 19, 1988, 63-66116; May 30, 1988, 63-72824; May 30, 1988, 63-72825
Int. Cl.[5] G03B *27/58*
U.S. Cl. 355—72 **11 Claims**



1. A cassette for accommodating therein a photo-sensitive recording medium, which comprises;

a cassette body having defined therein an accommodating chamber for the recording medium;

a drawing opening formed in an outer surface of the cassette body, the recording medium being drawn out of the accommodating chamber through the drawing opening;

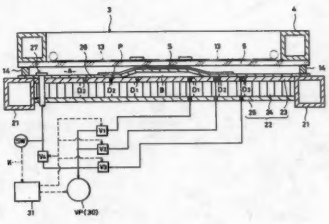
a feed passage, defined by a pair of opposedly arranged wall sections, having one end thereof communicating with the accommodating chamber and the other end communicating with the drawing opening such that the recording medium passes through the feed passage when the recording medium is drawn out of the accommodating chamber through the drawing opening; and

a light-shield member arranged in said feed passage, said member being formed of a resilient film, one end of which is secured to one of the wall sections while the other end is biased to normally contact the other wall section due to the resiliency thereof so as to press said recording medium to said other wall section and interrupt the penetration of an ambient light into the accommodating chamber.

4,984,017
VACUUM CONTACT TYPE PRINTING MACHINE AND METHOD OF CONTACT THEREFOR

Fumihiko Nishida, and Makoto Yahata, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1989, Ser. No. 409,859
Claims priority, application Japan, Oct. 31, 1988, 63-143132[U]
Int. Cl.[5] G03B *27/20*
U.S. Cl. 355—91 **14 Claims**



1. A vacuum printing device for printing with an original film and a photosensitive material being in contact with each other, comprising:

a flexible sheet for mounting said photosensitive material having end portions;

sheet holding means provided below said sheet and having at least a central portion and peripheral portions surrounding said central portion for fixing the end portions of said sheet;

a sealable exposure chamber containing said sheet and sheet holding means;

said exposure chamber having a contact surface provided facing said central portion of said sheet;

said photosensitive material placed on said sheet with the central portion positioned at the center;

first pressure adjusting means provided in said exposure chamber for setting said exposure chamber at a first pressure;

second pressure adjusting means provided on said sheet holding means for selectively applying said first pressure or a second pressure higher than said first pressure to a space between said sheet holding means and said sheet; and

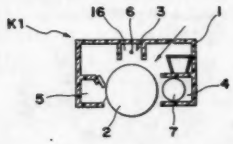
first switching means for setting an output from said second pressure adjusting means at said first pressure and thereafter switching the output successively to said second pressure from the central portion to the peripheral portion of said sheet holding means.

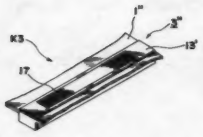
4,984,018

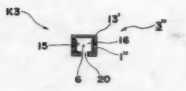
PROCESS CARTRIDGE HAVING AN INTEGRALLY MOLDED SHIELD CASING FOR THE CORONA CHARGER

Yukinori Andou; Yuhi Yui, and Kouichi Irihara, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1989, Ser. No. 444,311
Claims priority, application Japan, Dec. 13, 1988, 63-314403
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—200 5 Claims







1. A process cartridge comprising a casing made of a resin in which at least a photosensitive member and a corona charger are mounted, said corona charger including a shield casing and support portions for supporting a discharge wire molded integrally with said resin casing

said shield casing having an interior surface coated with an electrically conductive material.

4,984,019

ELECTRODE WIRE CLEANING

Jeffrey J. Folkins, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1990, Ser. No. 485,005
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—215 21 Claims

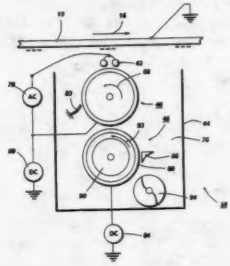
11. An electrophotographic printing machine of the type in which an electrostatic latent image recorded on a photoconductive member is developed to form a visible image thereof, wherein the improvement includes:

a housing defining a chamber storing a supply of developer material comprising at least carrier and toner;

a donor member spaced from the photoconductive member and being adapted to transport toner to a region opposed from the photoconductive member;

an electrode member positioned in a space between the photoconductive member and said donor member;

means for vibrating said electrode member to remove contaminants therefrom; and



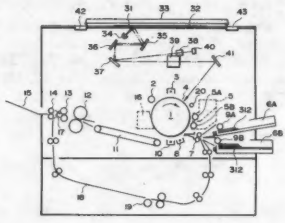
a transport member, located in the chamber of said housing, adapted to advance developer material from the chamber of said housing to said donor member.

4,984,020

COPYING APPARATUS HAVING AN AREA DESIGNATING FUNCTION

Hideki Adachi; Masahiro Tomosada, both of Kawasaki; Tadashi Suzuki, Yokohama, and Naoyuki Ohki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 97,428, Sep. 16, 1987, abandoned, which is a continuation of Ser. No. 732,628, May 10, 1985, abandoned. This application May 23, 1989, Ser. No. 355,877
Claims priority, application Japan, May 15, 1984, 59-95488; May 15, 1984, 59-95489; May 15, 1984, 59-95490
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—218 28 Claims



1. A copying apparatus comprising:

image area designating means, including input means for inputting coordinates in two dimensions, for designating an arbitrary area of an original in accordance with the coordinates input by said input means;

color designating means for designating a color for an image of the area of an original designated by said image area designating means;

display means for displaying a color designated by said color designating means;

means for visualizing onto a sheet the image of an area of an original designated by said image area designating means;

first control means for causing said visualizing means to visualize on a sheet an image of a first area designated by said image area designating means in a first color designated by said color designating means; and

second control means for causing said visualizing means to visualize on the same sheet an image of a second area designated by said image area designating means in a second color designated by said color designating means;

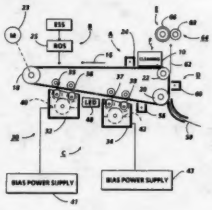
wherein said display means displays the color with which the image is being formed.

4,984,021

PHOTORECEPTOR EDGE ERASE SYSTEM FOR TRI-LEVEL XEROGRAPHY

James E. Williams, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 252,097, Sep. 30, 1988, Pat. No. 4,929,024.
This application Dec. 26, 1989, Ser. No. 456,429
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—245 4 Claims



1. Apparatus for forming discharged area images on a charge retentive surface without developing the edges of the charge retentive surface outside the image areas, said apparatus comprising:

means for uniformly charging a charge retentive surface substantially across its entire width including the edges thereof beyond the image areas thereof;

means for forming a discharged image area on said charge retentive surface intermediate said edges; and

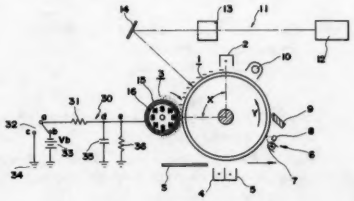
means for presenting developer material to said charge retentive surface that is attracted to said discharged image area and repelled by said charged edges.

4,984,022

IMAGE FORMING APPARATUS HAVING MEANS FOR ATTENUATING BIAS VOLTAGE OF THE DEVELOPING SLEEVE

Kouji Matsushita, and Shizuo Yuge, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 23, 1988, Ser. No. 275,505
Claims priority, application Japan, Nov. 26, 1987, 62-298517; Nov. 26, 1987, 62-298518; Nov. 26, 1987, 62-298519
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—246 16 Claims



1. An image forming apparatus using an electrophotographic copy process comprising:

a developing sleeve disposed so as to confront a photosensitive member and carrying a developer on an outer periphery thereof;

a voltage source applying a specific bias voltage to said developing sleeve;

interrupting means for interrupting image formation; and

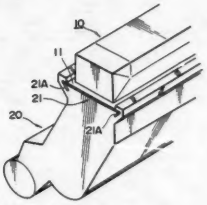
means for attenuating the bias voltage of said developing sleeve according to decay characteristics substantially similar to dark decay characteristics of said photosensitive member when the image formation is interrupted by said interrupting means.

4,984,023

TONER CARTRIDGE

Tatsuya Yoshida, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 506,828
Claims priority, application Japan, Apr. 12, 1989, 1-42672[U]
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—260 9 Claims



1. A toner cartridge arranged to be attachably and detachably mounted on a developing unit adapted to be positioned in an imaging device of the electrophotographic type, said toner cartridge comprising:

a container, made of a predetermined bendable material, for containing toner; and

a base, including an engagement portion, arranged to be brought into engagement with a predetermined portion of said developing unit, and a holding member, detachably provided on said base, for holding toner in said container.

4,984,024

IMAGE TRANSFER UNIT FOR IMAGE RECORDING APPARATUS

Hiroyuki Ohkaji; Itaru Matsuda, both of Yokohama, and Masato Yanagida, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1989, Ser. No. 350,695
Claims priority, application Japan, May 11, 1988, 63-61100[U]; Jul. 4, 1988, 63-87962[U]; Dec. 8, 1988, 63-158982[U]; Mar. 15, 1989, 61-60612
Int. Cl.[5] G03G *15/14, 15/01*
U.S. Cl. 355—273 12 Claims

1. An image transfer unit for an image recording apparatus, comprising:

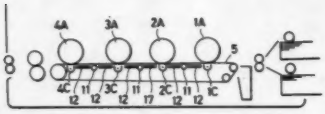
a plurality of photoconductor units on which a toner image is formed;

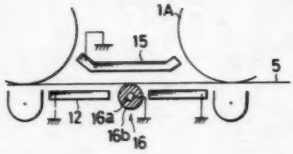
a dielectric transfer belt which circulates along and in contact with said plurality of photoconductor units on an outer surface of said transfer belt for conveying record papers;

at least one transfer charger for applying an electric field and for transferring the toner image from each of said plurality of photoconductor units to the record papers conveyed on said transfer belt in such a manner that a plurality of toner images are superposed on each other one by one; and

a lower electric conductive member for stabilizing the electric field of the at least one transfer charger, said lower electric conductive member being disposed at and spaced from an inner surface side of said transfer belt in the vicin-

ity of said plurality of photoconductor units at a predetermined distance from an inner surface of said transfer belt,





said lower conductive member being grounded and in the form of a flat plate.

4,984,025

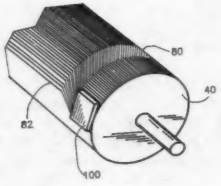
IMAGING SYSTEM WITH INTERMEDIATE TRANSFER MEMBER

Benzion Landa, Edmonton, Canada; Amiran Lavon, Bat Yam, Israel; Hanna Pinhas, Holon, Israel, and Yossi Adam, Rehovot, Israel, assignors to Spectrum Sciences B.V., AE Rotterdam, Netherlands

Filed Feb. 6, 1989, Ser. No. 306,065

Int. Cl.[5] G03G *15/16*

U.S. Cl. 355—274 **36 Claims**



1. Apparatus for image transfer comprising:

an image bearing surface having charged image particles thereon, and an image receiving member comprising an elastic outer layer having at least one ply of elastic material defining an outer image receiving surface arranged for relative movement along a pathway whereby regions of the image bearing surface and the image receiving surface sequentially come into propinquity for image transfer therebetween and subsequently move out of propinquity following image transfer therebetween;

potential impression means contained within at least one portion of said elastic outer layer for impressing a potential between said at least one portion and said image bearing surface; and

means for energizing said potential impression means only when said at least one portion is located at a predetermined location along said pathway, thereby to provide desired image transfer enhancement.

4,984,026

COLOR IMAGE FORMING METHOD

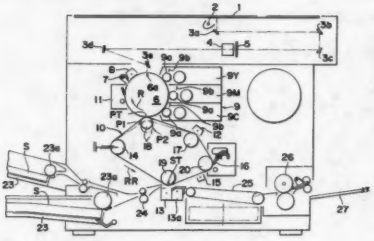
Hideya Nishise, and Akihiro Nishida, both of Osaka, Japan, assignors to Minolta Camera Kabushikia Kaisha, Osaka, Japan

Filed Apr. 24, 1989, Ser. No. 342,358

Claims priority, application Japan, Apr. 25, 1988, 63-103438; Apr. 25, 1988, 63-103439

Int. Cl.[5] G03G *15/14, 15/01*

U.S. Cl. 355—277 **6 Claims**



1. A color image forming method using a toner image retaining member, said method comprising steps of:

sequentially forming a plurality of electrostatic latent images corresponding to respective color components of an image of a document on a photoconductive member;

sequentially developing the electrostatic latent images with respective toners of different colors electrically charged with a predetermined polarity so as to form the corresponding visible toner images on said photoconductive member;

electrically charging a surface of said toner image retaining member with a polarity opposite to that of said respective toners;

sequentially transferring the toner images formed on said photoconductive member onto said toner image retaining member by bringing said electrically charged surface of said toner image retaining member into contact with said photoconductive member at a transfer station so as to form a color image on said toner image retaining member, the surface of said toner image retaining member being suitably electrically charged at a station apart from the transfer station before transferring the toner image in order to keep a predetermined electric potential which is necessary to transfer the toner image properly without electrically charging said surface at said transfer station; and

transferring the color image formed on the toner image retaining member onto a paper.

4,984,027

FUSING APPARATUS WITH SOLID ELASTOMERIC FUSER ROLLER

John E. Derimiggio, Fairport, and Linn C. Hoover, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1988, Ser. No. 290,799

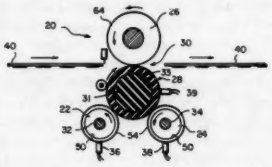
Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—290 **10 Claims**

1. A fuser roller in an electrostatographic copier or printer for use in an apparatus for fusing toner images to a receiver through the application of heat and pressure, the fuser roller consisting entirely of:

(a) a solid cylindrical inner portion having no internal cavity, said inner portion being made of a first elastomeric material; and

(b) an annular outer portion made of a second elastomeric material overlaying said cylindrical inner portion said second portion having a smooth surface suitable for contacting the toner images during fusing.

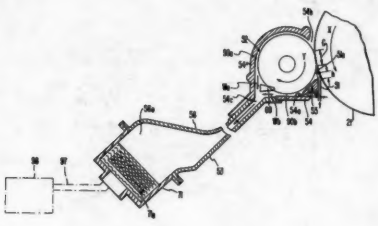


4,984,028

CLEANING UNIT FOR CLEANING RECORDING MEDIUM OF AN ELECTROPHOTOGRAPHIC APPARATUS

Yoshihiro Tonomoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1988, Ser. No. 284,101
Claims priority, application Japan, Dec. 18, 1987, 62-318637
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—297 **11 Claims**



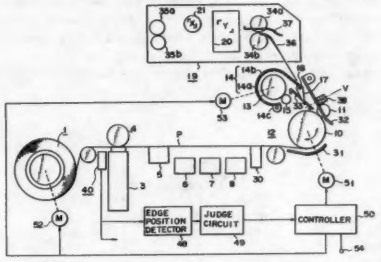
1. An image transfer type recording apparatus comprising:
a drum rotatable around a substantially horizontal axis;
a recording medium layer formed on said drum for forming a toner image on the surface of said recording medium layer;
a toner image transfer means disposed adjacent to the top portion of said drum for transferring said toner image to a printing medium; and
a cleaning unit disposed downstream from said toner image transfer means with respect to the rotation of said drum, for cleaning the surface of said recording medium layer after image transfer, said cleaning unit comprising:
a blade extending across said drum and having a cleaning edge in contact with said recording medium layer for scraping said layer to remove contaminants thereon as said drum rotates;
rotatable cleaning means extending across said drum, disposed upstream from said blade in engagement with said recording medium layer for removing contaminants thereon as said drum rotates;
a housing enclosing said blade and said rotatable cleaning means and having an opening for the entry of external air and an outlet for the exit of air; and
suction means connected to said outlet for excavating the space inside said housing;
said rotatable cleaning means having an air passage for passing external air into a space in said housing which is surrounded by surfaces of said rotatable cleaning means, said blade, and said drum, and connected to said suction means, whereby the velocity of the air flow in said space is enhanced to facilitate removal of said contaminants from the surface of said drum.

4,984,029

ROLLED RECORDING PAPER SETTING APPARATUS

Masaji Nishikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1989, Ser. No. 416,114
Claims priority, application Japan, Oct. 7, 1988, 63-253040
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—310 **3 Claims**



1. A rolled recording paper setting apparatus for use with a multi-color image recording apparatus which includes a recording paper roll from which recording paper is extracted, an image recording processing station, a recording paper feed roller, and a recording paper take-up roller, for reciprocating, between feed and rewind directions, an extracted portion of rolled recording paper stretched between said recording paper roll and said recording paper take-up roller a plurality of times, and obtaining a multicolor image by overlapping and forming images of different colors in the same image area of the recording paper by operating said image recording processing station during reciprocation periods, said rolled recording paper setting apparatus comprising:
reciprocating drive means for reciprocating a predetermined length of the recording paper in said feed and rewind directions; and
operation control means coupled to said reciprocating drive means for causing said reciprocating drive means to reciprocate the recording paper a plurality of times prior to image recording at least during an initialization mode at the time when rolled recording paper is newly set at a predetermined position upon replacement thereof, to thereby prevent color misregistration when said image recording processing station is thereafter operated to produce a multicolor image.

4,984,030

VERTICAL MOSFET DRAM

Hideo Sunami, Nishitama; Tokuo Kure, Kokubunji; Yoshifumi Kawamoto, Tsukui; Masao Tamura, and Masanobu Miyao, both of Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 904,397, Sep. 8, 1986, Pat. No. 4,751,557, which is a continuation of Ser. No. 474,002, Mar. 10, 1983, abandoned. This application May 31, 1988, Ser. No. 201,100
Claims priority, application Japan, Mar. 10, 1982, 57-36418
Int. Cl.[5] H01L *27/108*
U.S. Cl. 357—23.6 **18 Claims**

1. A semiconductor random access memory which is formed in a semiconductor substrate comprising:
a plurality of memory cells each of which includes a capacitor for storing information and an insulated gate field effect transistor for reading out the information stored in said capacitor, wherein each of the insulated gate field effect transistors has a channel region formed in a vertical

direction perpendicular to a first main surface of the semiconductor substrate;

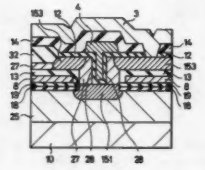
word lines for applying signals to a gate electrode of each of the insulated gate field effect transistors;

bit lines for reading out the information stored in said capacitors,

wherein the capacitors each include a capacitor electrode formed in said substrate, and a capacitor plate provided with a constant voltage,

wherein one of the source or drain regions of each of the insulated gate field effect transistors is electrically connected to the capacitor electrode of the respective capacitor, each of the gate electrodes of the insulated gate field effect transistors is electrically connected to the respective word line, and the other of the drain or source regions of each of the insulated gate field effect transistors is electrically connected to the respective bit line;

a capacitor insulating film formed between the capacitor electrode and the capacitor plate,



wherein each of said insulated gate field effect transistors is formed to include a first region in contact with the capacitor electrode to serve as a source or drain region for said insulated gate field effect transistors;

a gate insulating film extending vertically over said first region to define a groove formed by an inner sidewall of the gate insulating film;

a gate electrode formed in said groove to be separated from the first region by the gate insulating film; and

a second region formed above the first region and along an outer sidewall of said gate insulating film to be in contact with the first region and isolated from the gate electrode by the gate insulating film, wherein said second region serves as said channel region, and

wherein at least a portion of each of said insulated gate field effect transistors is formed on at least a portion of the respective capacitor.

4,984,031

INTEGRATED CIRCUIT ARRANGEMENT

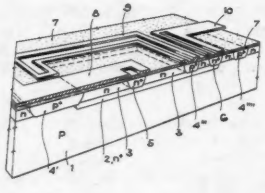
Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 188,554

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714647

Int. Cl.[5] H01L *29/90*

U.S. Cl. 357—13 **27 Claims**



1. In an integrated circuit arrangement having respective current input and ground terminals, and including a protective circuit means, connected between said current input terminal and the remainder of the integrated circuit arrangement, for protecting the integrated circuit from excessive electrical potentials, caused by electrical faults, occurring at said current input terminal; the improvement wherein said protective circuit arrangement includes:

an integrated resistance means, connected in series between said current input terminal and a signal input for the remainder of said integrated circuit, for providing a predetermined ohmic resistance sufficient to absorb a major portion of the energy from an electrical fault appearing at said current input terminal and for distributing the heat generated by the energy absorption over a surface of said protective circuit without thermal overloading; and

at least one voltage-limiting means, connected between said signal input and ground, for connecting said signal input to ground when the voltage between said signal input and ground exceeds a predetermined value.

4,984,032

SEMICONDUCTOR PHOTODIODE

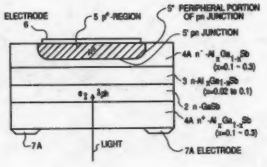
Shuichi Miura, Kawasaki; Takashi Mikawa, Tokyo; Haruhiko Kuwatsuka, Yokohama, and Nami Yasuoka, Hachioji, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 17, 1989, Ser. No. 297,391

Claims priority, application Japan, Jan. 18, 1988, 63-7702

Int. Cl.[5] H01L *29/161, 29/90, 27/14*

U.S. Cl. 357—16 **20 Claims**



1. A semiconductor photodiode, comprising:

a substrate formed of one of an n-type $Al_xGa_{1-x}Sb$ semiconductor and an n-type $Al_xGa_{1-x}Sb_yAs_{1-y}$ semiconductor having a first band gap energy, where the aluminum content ratio x is within a range from 0.1 to 0.3 and the antimony content ratio y is within a range from 0 to 1, said substrate having a first surface for receiving light having a wavelength within a range of substantially 1.3 μm to 1.55 μm, a second surface, and a light receiving region;

a light absorbing layer formed of an n-type GaSb semiconductor on the second surface of said substrate, said light absorbing layer receiving the light passing through said substrate and producing carriers corresponding to the intensity of the received light;

a multiplication layer formed of one of an n-type $Al_{x'}Ga_{1-x'}Sb$ semiconductor and an n-type $Al_{x'}Ga_{1-x'}Sb_{y'}As_{1-y'}$semiconductor, where the aluminum content ratio x' is within a range from 0.02 to 0.1, and the antimony content ratio y' is within a range from 0 to 1, said multiplication layer formed on said light absorbing layer, the aluminum content ratio x' in said avalanche multiplication layer being chosen so as to generate an essentially maximum ionization rate ratio of positive holes and electrons by a resonant impact ionization phenomenon;

a surface layer formed of one of an n-type $Al_{x''}Ga_{1-x''}Sb$ semiconductor and an n-type $Al_{x''}Ga_{1-x''}Sb_{y''}As_{1-y''}$ semiconductor on said multiplication layer, where the aluminum content ratio of x'' is within a range from 0 to 1 and the antimony content ratio y'' is within a range from 0 to 1; and

an impurity region formed of a p-type semiconductor doped in said surface layer through a surface opposite from said multiplication layer;

a first electrode formed on said first surface of said substrate, through which a voltage is applied, said first electrode being shaped so as to allow incidence of the light into the light receiving region of said substrate; and

a second electrode formed on said impurity region, through which a positive voltage is applied with respect to the voltage applied to said first electrode.

4,984,033

THIN FILM SEMICONDUCTOR DEVICE WITH OXIDE FILM ON INSULATING LAYER

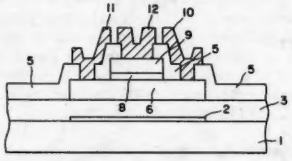
Akira Ishizu, Amagasaki; Tadashi Nishimura, and Yasuo Inoue, both of Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 30,904, Mar. 31, 1987, Pat. No. 4,822,251. This application Dec. 21, 1988, Ser. No. 287,146

Claims priority, application Japan, Apr. 2, 1986, 61-77413

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 **11 Claims**



1. A thin film semiconductor device, the thin film semiconductor device having a gate, gate oxide, and source, gate, and drain electrodes, said device comprising:

a transparent substrate;

a light shielding layer formed on the substrate;

an insulating layer formed over said light shielding layer;

a semiconductor active layer formed over said insulating layer;

a gate oxide film formed on the semiconductor active layer;

a gate formed on the gate oxide film;

an oxide film formed directly on the insulating layer, the semiconductor active layer and the gate; and

a source electrode and a drain electrode formed on the oxide film and the semiconductor active layer, and a gate electrode formed on the oxide film and the gate.

4,984,034

NON-SINGLE-CRYSTALLINE LIGHT EMITTING SEMICONDUCTOR DEVICE MATRIX WITH INSULATION

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Continuation of Ser. No. 14,184, Feb. 11, 1987, abandoned, which is a division of Ser. No. 742,700, Jun. 7, 1985, abandoned, which is a division of Ser. No. 347,359, Feb. 9, 1982, Pat. No. 4,527,179. This application Dec. 5, 1988, Ser. No. 281,957

Claims priority, application Japan, Feb. 9, 1981, 56-18420; Feb. 13, 1981, 56-19900

Int. Cl.[5] H01L *33/00*

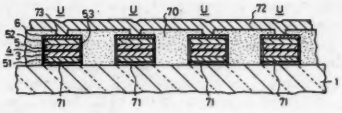
U.S. Cl. 357—17 **9 Claims**

1. A light emitting semiconductor device comprising:

a transparent glass substrate;

a plurality of light emitting elements consisting of non-single-crystalline semiconductor which are in the form of a matrix;

an insulator disposed between and in direct contact with the side surfaces of said light emitting elements and with which the spaces between said elements are completely filled; and



a plurality of column electrode lines and a plurality of row electrode lines for addressing particular elements and causing light emission from said particular elements through said transparent glass substrate.

4,984,035

MONOLITHIC LIGHT EMITTING DIODE ARRAY

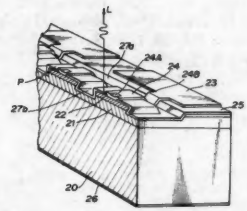
Ryosaku Kanzawa, Ibaraki; Ken Takahashi; Hisumi Sano, both of Hitachi, and Kazuhiro Kurata, Hachioji, all of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

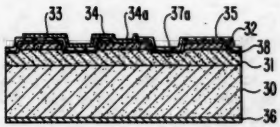
Continuation-in-part of Ser. No. 802,342, Nov. 25, 1985, abandoned. This application Apr. 7, 1988, Ser. No. 178,648

Claims priority, application Japan, Nov. 26, 1984, 59-249350; Jul. 12, 1985, 60-152341; Oct. 15, 1985, 60-229727; Apr. 15, 1987, 62-91017

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 **2 Claims**





1. A monolithic light emitting diode array comprising:

at least one mixed crystal layer formed on a GaAs substrate by epitaxial growth to provide a P-N junction at the boundary surface thereof, said mixed crystal layer including either a p-GaAlAs layer or a n-GaAlAs layer grown on said GaAs substrate;

a row of a plurality of light emitting diode portions each having said P-N junction;

two forward mesa etching grooves each provided on opposite sides of said row of a plurality of light emitting diode portions;

a plurality of reverse mesa etching grooves each provided so as to be orthogonal to said two forward mesa etching grooves and positioned between said plurality of light emitting diode portions;

a plurality of individual electrodes each having an electrode portion corresponding to each of said plurality of light emitting diode portions and being arranged alternately on opposite sides of said row of plurality of light emitting

diode portions so as to cross the corresponding one of said two forward mesa etching grooves in coincidence with a concave surface shape thereof;

a common electrode provided on a back surface of said substrate; and

an electric isolation protection film consisting of an SiO_2 film, and an interposed film consisting of a P-SiO_2 glass film formed between said electric isolation protection film and the surface of said p-GaAlAs layer or n-GaAlAs layer grown on the GaAs substrate.

wherein said electrode portion is narrower than said each of said plurality of light emitting diode portions so that light radiates in a direction orthogonal to a plane of said P-N junction, each of said plurality of individual electrodes is much wider than said each of said plurality of light emitting diode portions so as to facilitate a wirebonding thereon, and

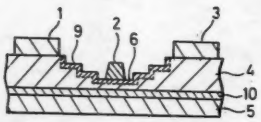
said interposed film of P-SiO_2 is formed so as to have a content of P which is gradually decreased in the direction toward said electric isolation film by reducing a flowing amount of a P-compound gas in a CVD process, whereby said electric isolation protection film of SiO_2 film is formed by continuing a deposition in said CVD process in a state such that said flowing amount is zero.

4,984,036

FIELD EFFECT TRANSISTOR WITH MULTIPLE GROOVES

Shinichi Sakamoto, and Takuji Sonoda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaishi, Japan

Filed Jun. 19, 1989, Ser. No. 367,685
Claims priority, application Japan, Jun. 20, 1988, 63-153071
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **5 Claims**



1. A transistor including a semiconductor substrate, a doped, active semiconductor layer supported by said semiconductor substrate, a source electrode, a gate electrode, and a drain electrode disposed on said active semiconductor layer, said gate electrode being disposed between said source and drain electrodes for controlling current flow through said active layer between said source and drain electrodes, said active layer including a recess configuration including at least three steps that becomes narrower at each step as the recess approaches said substrate, wherein said gate electrode is disposed on said active layer in the portion of the recess closest to said substrate.

4,984,037

SEMICONDUCTOR DEVICE WITH CONDUCTIVE RECTIFYING RODS

Brian M. Ditchek, Milford, Mass.; Adrian I. Cogan, San Jose, Calif.; Enid K. Sichel, Lincoln, Mass., and Walter L. Bloss, III, Palos Verdes, Calif., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 11, 1986, Ser. No. 941,478
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **14 Claims**

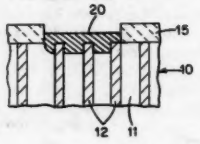
1. A field effect transistor comprising

a body including a matrix of single crystal semiconductor material having disposed therein an array of individual rods of conductive material forming rectifying barriers at the interfaces of the rods and the semiconductor material;

said rods of said array being distributed throughout said body and extending from a first major surface of said body to a second major surface generally parallel to said first major surface;

said rods of said array being disposed generally parallel to each other and transverse to said major surfaces of said body with said rods each having one end thereof exposed at said first major surface;

a gate contact member in ohmic contact with a plurality of said rods at said one end of each of the rods of said plurality; and



a source contact member in ohmic contact with the semiconductor material of said matrix and a drain contact member in ohmic contact with the semiconductor material of said matrix so that current flow through the semiconductor material of the matrix from the source contact member to the drain contact member is controlled by biasing conditions applied to the gate contact member;

wherein

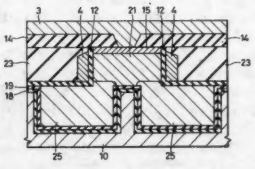
the conductor material of said rods is a conductive compound of a first metal and the semiconductor material of the matrix or of a first metal and a constituent element of the semiconductor material.

4,984,038

SEMICONDUCTOR MEMORY AND METHOD OF PRODUCING THE SAME

Hideo Sunami, Nishitama; Makoto Ohkura, Hachioji; Masanobu Miyao, Tokorozawa; Kikuo Kusukawa, Hachioji; Masahiro Moniwa, Kokubunji; ShinIchiro Kimura, Hachioji; Terunori Warabisako, Nishitama, and Tokuo Kure, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 81,142, Aug. 3, 1987, Pat. No. 4,937,641, which is a continuation of Ser. No. 654,459, Sep. 26, 1984, abandoned. This application May 17, 1988, Ser. No. 194,980
Claims priority, application Japan, Sep. 28, 1983, 58-177952; Dec. 28, 1983, 58-246948
Int. Cl.[5] H01L *29/68, 29/10, 29/34, 29/04*
U.S. Cl. 357—23.6 **6 Claims**



1. A semiconductor random access memory formed on a semiconductor substrate, said random access memory having a plurality of memory cells which each comprise:

a capacitor including a capacitor node formed in a groove formed in the substrate, a capacitor plate formed as a portion of the substrate, and a capacitor dielectric film isolating said capacitor plate from said capacitor node; and

a field effect transistor at least partially formed over said

capacitor node, said field effect transistor including a semiconductor portion formed over said capacitor node, wherein a bit line is coupled to a source-drain path of said field effect transistor, wherein a word line is respectively coupled to said field effect transistor to serve as a gate electrode for the field effect transistor between said bit line and said capacitor node, wherein applying a predetermined voltage to said word line increases a channel between said capacitor node and said bit line to connect said capacitor node to said bit line, and wherein said channel extends vertically in substantially a straight line between said capacitor node and said bit line.

4,984,039

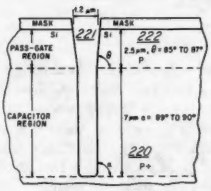
TAPERED TRENCH STRUCTURE AND PROCESS

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 341,278, Apr. 18, 1989, abandoned, which is a continuation of Ser. No. 26,491, Mar. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 841,502, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 730,701, May 3, 1985, Pat. No. 4,702,795. This application Jun. 11, 1990, Ser. No. 537,213

Int. Cl.[5] H01L *29/68, 29/06, 27/02*

U.S. Cl. 357—236 **31 Claims**



1. An integrated circuit having a sidewall formed in a surface of a monocrystalline substrate comprising:

(a) a first portion of said sidewall being positively sloped;

(b) a second portion of said sidewall being substantially vertical and without bowing or undercut; and

(c) a material in contact with at least a part of said sidewall.

4,984,040

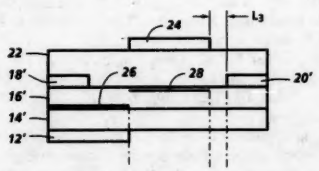
HIGH VOLTAGE THIN FILM TRANSISTOR WITH SECOND GATE

Peng K. Yap, San Francisco, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 15, 1989, Ser. No. 366,822

Int. Cl.[5] H01L *27/01, 27/13, 29/78, 27/12*

U.S. Cl. 357—23.7 **15 Claims**



1. A high voltage thin film transistor comprising a non-single crystal semiconductor charge transport layer, laterally disposed source and drain electrodes located adjacent to one surface of said charge transport layer, means for applying a constant high electrical potential to said drain electrode, a first gate dielectric layer located adjacent to an opposite surface of said charge transport layer, a first gate electrode separated from said opposite surface of said charge transport layer by said first gate dielectric layer, said first gate electrode having one edge laterally overlapping said source electrode and another edge laterally spaced from said drain electrode, and means for applying an electrical potential to said first gate electrode in a time varying manner so as to form a first accumulation channel of a given conductivity type periodically opposite to said first gate electrode in said charge transport layer, said transistor being characterized by including

second gate electrode means for forming a second accumulation channel extending laterally from said first accumulation channel toward said drain electrode, said second accumulation channel of said given conductivity type being less accumulated than said first accumulation channel, and

means for applying an electrical potential to said second gate electrode means for preventing depletion of charge carriers within said second accumulation channel.

4,984,041

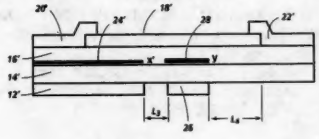
HIGH VOLTAGE THIN FILM TRANSISTOR WITH SECOND CONTROL ELECTRODE

Michael Hack, Mountain View, and John G. Shaw, Portola Valley, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 28, 1989, Ser. No. 387,324

Int. Cl.[5] H01L *27/01, 27/13, 29/78, 27/12*

U.S. Cl. 357—23.7 **4 Claims**



1. A high voltage thin film transistor comprising an amorphous semiconductor charge transport layer, laterally disposed source and drain electrodes located adjacent to said charge transport layer, a source of reference potential connected to said source electrode, a gate dielectric layer located adjacent to said charge transport layer, a first control electrode separated from said charge transport layer by said gate dielectric layer, said first control electrode having one edge laterally overlapping said source electrode and an other edge laterally spaced from said drain electrode, a source of high electrical potential connected to said drain electrode and a source of low electrical potential connected to said first control electrode for forming a conducting channel in said charge transport layer at a location opposite to said first control electrode in a time varying manner, said transistor being characterized by including

a second control electrode being coplanar with said first control electrode, being separated from said charge transpost layer by said gate dielectric layer, and being laterally spaced from said first control electrode and said drain electrode, and

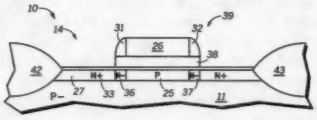
a source of electrical potential, of a value intermediate said high and said reference electrical potentials, connected to said second control electrode, for preventing depletion of carriers within said charge transport layer adjacent said other edge of said first control electrode.

4,984,042

MOS TRANSISTORS USING SELECTIVE POLYSILICON DEPOSITION

James R. Pfiester; Frank K. Baker, and Richard D. Sivan, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1989, Ser. No. 309,589
Int. Cl.[5] H01L 29/78
U.S. Cl. 357—23.9 4 Claims



1. A device structure formed in an active region bounded by field oxide in a substrate of a first type and concentration at a stage in processing, comprising:

an insulator layer over all of the active region;

a polysilicon layer of substantially uniform thickness over the insulator layer and over all of the active region; and

a selectively-deposited polysilicon strip overlying the polysilicon layer and an intermediate region of the active region leaving a first region of the active region on a first side of the polysilicon strip and a second region of the active region on a second side of the polysilicon strip uncovered by the polysilicon strip;

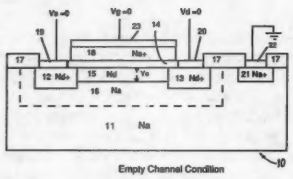
wherein said first and second regions are of the first type and concentration of said substrate and said intermediate region is of the first type and of a concentration different from that of the substrate.

4,984,043

FERMI THRESHOLD FIELD EFFECT TRANSISTOR

Albert W. Vinal, Cary, N.C., assignor to Thunderbird Technologies, Inc., Cary, N.C.

Continuation-in-part of Ser. No. 318,153, Mar. 2, 1989. This application Jun. 22, 1989, Ser. No. 370,398
Int. Cl.[5] H01L 29/78, 29/86
U.S. Cl. 357—23.14 24 Claims



1. A field effect transistor comprising:

a semiconductor substrate having a first surface, and being doped at a first dopant density;

a substrate contact for electrically contacting said substrate;

means for applying a substrate bias voltage to said substrate contact;

source and drain regions in said substrate at said first surface;

a channel in said substrate at said first surface, between said source and drain regions, said channel being doped at a second dopant density and having a predetermined depth from said first surface;

a gate insulating layer on said substrate at said first surface adjacent said channel, at least said first and second dopant densities, said substrate bias voltage and said predetermined depth being selected to produce zero electric field at said first surface between said channel and said gate insulating layer; and

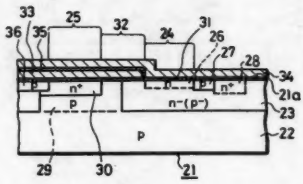
source, drain and gate contacts for electrically contacting said source and drain regions and said gate insulating layer, respectively.

4,984,044

SOLID STATE IMAGER DEVICE

Michio Yamamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1987, Ser. No. 28,588
Claims priority, application Japan, Mar. 25, 1986, 61-66605
Int. Cl.[5] H01L 29/78, 27/14, 29/34
U.S. Cl. 357—24 5 Claims



1. A solid state imager device comprising: a semiconductor substrate having a substrate region of a first conductivity type, a light receiving area of a second conductivity type forming a light receiving section, a charge transfer section which has a low impurity concentration region arranged under and in contact with said light receiving area and between said light receiving area and said substrate region;

a forward electrode formed on said semiconductor substrate over a dielectric layer; and

a charge transfer control electrode formed on said dielectric layer and extending between said light receiving section and said charge transfer section,

wherein said forward electrode is supplied with a voltage so as to form a charge storage layer in said light receiving area under said dielectric layer and said forward electrode, and an edge of said transfer control electrode substantially coinciding with an edge of said light receiving area at a side which faces said charge transfer section.

4,984,045

OUTPUT SENSOR OF CHARGE TRANSFER DEVICE

Yoshiyuki Matsunaga, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 12, 1988, Ser. No. 218,291
Claims priority, application Japan, Jul. 13, 1987, 62-174120
Int. Cl.[5] H01L 29/78, 29/10, 29/68
U.S. Cl. 357—24 7 Claims

7. An output sensor of a charge transfer device comprising:

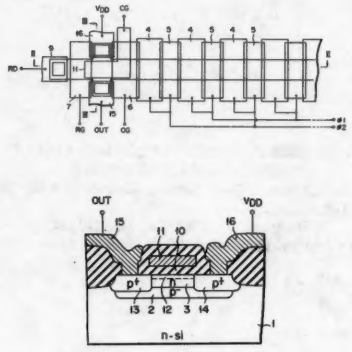
a semiconductor substrate of a first conductivity type;

a well region of a second conductivity type having a low impurity concentration and formed in the surface area of said semiconductor substrate;

a charge-sensing buried channel region of the first conductivity type formed in part of the surface area of said well region, part of the well region which lies under said channel region being set in substantially the depletion state;

a floating gate electrode and a control gate electrode, both

formed on said charge-sensing buried channel region via a gate insulation film; and



source and drain regions of the second conductivity type disposed on both sides of said charge-sensing buried channel region in a width direction thereof.

4,984,046

SILICON PRESSURE SENSOR HAVING A RESISTANCE LAYER OF POLYCRYSTALLINE SEMICONDUTOR

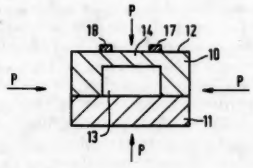
Volker Graeger, Buchholz; Rolf U. D. Kobs, Tornesch; Horst Schäfer, Hannoversch Münden, and Heinrich Zeile, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 27, 1989, Ser. No. 344,199

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814348

Int. Cl.[5] H01L *29/84*

U.S. Cl. 357—26 **17 Claims**



1. A silicon pressure sensor comprising a silicon body which is provided on a carrier and has at its major surface remote from the carrier an insulating layer and a cavity which is open on a surface of the carrier, has the form of a blind hole and forms a diaphragm, the surface of said silicon body remote from the cavity in the form of a blind hole being provided with four resistance elements, which elements consist of a semiconducting doped polycrystalline resistance layer of silicon, a passivation layer provided on the polycrystalline resistance layer and a structured metal layer provided on the passivation layer and electrically contacting the polycrystalline resistance layer, characterized in that the polycrystalline resistance layer (3) consists of a first polycrystalline doped silicon layer (4) and a further polycrystalline doped silicon layer (5) provided on the first polycrystalline silicon layer (4) and having a coarser crystallite structure with respect to that of the first polycrystalline silicon layer.

4,984,047

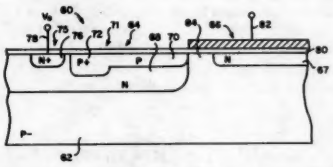
SOLID-STATE IMAGE SENSOR

Eric G. Stevens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1988, Ser. No. 171,042

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **6 Claims**



1. A solid-state image sensor comprising:

a semiconductor substrate of a first conductivity type;

a photosensitive region of a second conductivity type formed in said substrate;

a drain region in said photosensitive region, said drain region being of said second conductivity type and being of enhanced conductivity;

a virtual-gate region formed in said photosensitive region for controlling the flow of excess signal carriers from said photosensitive region into said drain region, said virtual-gate region extending along at least one side of said drain region and spaced therefrom, said virtual-gate region being of said first conductivity type and of enhanced conductivity; and

means for reading out signal carriers generated in said photosensitive region.

4,984,048

SEMICONDUCTOR DEVICE WITH BURIED SIDE CONTACT

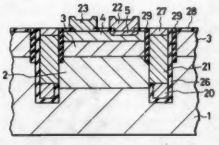
Kazuhiko Sagara, Hachioji; Tokuo Kure, Kokubunji; Eiichi Murakami, Fuchu; Tohru Nakamura, Tanashi; Masanobu Miyao, Tokorozawa; Masao Kondo, Hachioji; Akitoshi Ishizaka, and Yoichi Tamaki, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,536

Claims priority, application Japan, Jul. 10, 1987, 62-171146; Nov. 2, 1987, 62-275818; Dec. 7, 1987, 62-307510

Int. Cl.[5] H01L *29/72, 29/06*

U.S. Cl. 357—34 **30 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a horizontal surface region;

a trench having an inner side surface, an upper edge portion and bottom surface, and formed in said semiconductor substrate;

a plurality of bipolar transistors horizontally spaced from each other and being isolated from each other by said trench;

said trench having an insulating film formed on its inner surface;

a low-resistance conductive material filling said trench on the inside of said inner surface of said trench;

at least one of said bipolar transistors having a vertical stack of collector and emitter regions formed on said semiconductor substrate, a base formed vertically between said collector and emitter regions, and said collector being the lower of said regions having a bottom surface at a higher level than the bottom surface of the trench;

said insulating film having an opening at said trench inner side surface leading to said collector; and

said collector being electrically connected to said conductive material in said trench through said opening formed in said insulating film so that said conductive material is a collector, lead-out interconnection layer.

4,984,049

STATIC INDUCTION THYRISTOR

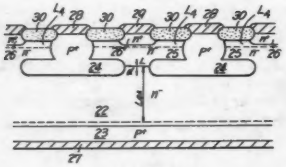
Jun-ichi Nishizawa; Tadahiro Ohmi, both of Sendai, and Yoshinobu Ohtsubo, Yokohama, all of Japan, assignors to Zaidan Hozin Handotai Kenkyu Shinkokai and Toyo Denki Seizo Kabushiki Kaisha, Japan

Continuation of Ser. No. 888,577, Jul. 21, 1986, which is a continuation of Ser. No. 403,635, Jul. 20, 1982. This application Jul. 5, 1988, Ser. No. 215,037

Claims priority, application Japan, Nov. 21, 1980, 55-163382

Int. Cl.[5] H01L *29/74, 29/06*

U.S. Cl. 357—38 **32 Claims**



1. A static induction thyristor, comprising a high resistance semiconductor substrate (2) of one conductivity type, a low resistance anode region (3) of the other conductivity type on one main surface of said substrate, a gridlike, low resistance gate region (4) of said other conductivity type buried in the opposite surface of said substrate, and having the same impurity concentration with that of the anode region (3) and made by a same diffusion step, a high resistance and relatively low doped region (5) of said one conductivity type over said gate region (4) including a middle resistance region (L_4) having a substantially homogeneous impurity concentration in the range 3×10^{15} to 6×10^{15} cm^{-3} interposed between the high resistance region (5) and a cathode region and having a thickness of one to three microns, and a low resistance cathode region (6) of said one conductivity type over said high resistance region (5), and respective anode, gate, and cathode electrodes (7), (8) and (9) each connected respectively with the exposed portions of said anode region (3), gate region (4), and cathode region (6), wherein forward direction anode voltage may be applied between said anode and cathode electrodes, and a reverse direction gate voltage may be applied between said gate and cathode electrodes, the thyristor including

(a) said high resistance region (5) having an effective impurity concentration in the range of 10^{11} to 5×10^{14} cm^{-3}; and

(b) a gate having its size which satisfies the voltage gain (μ) relationship:

$$\mu = L \cdot L_{GA}/d^2 > 10$$

where L is the diameter or length of said gate,

d is the interval between adjacent gates,

L_{GA} is the depth of a depletion layer between the gate region (4) and the anode region (3),

wherein the static induction thyristor satisfies either of the following formulae at the turn-off operation;

$$r_{GI}I_{GP} < V_{GO} + V_{bi}$$

and

$$r_{GI}I_{GP} < V_{bi}.$$

4,984,050

GATE-ARRAY TYPE INTERGATED CIRCUIT SEMICONDUCTOR DEVICE

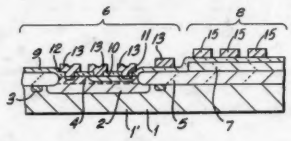
Masaharu Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 297,628

Claims priority, application Japan, Jan. 14, 1988, 63-7160

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—41 **8 Claims**



1. A gate-array type integrated circuit semiconductor device comprising:

a semiconductor substrate having a major surface and provided with a basic cell forming portion and a wiring channel forming portion, said wiring channel forming portion extending in a first direction;

a plurality of impurity regions of basic circuit elements formed in said basic cell forming portion to form a plurality of basic cells which constitute a plurality of basic cell lines on said substrate;

a field insulating layer formed on said substrate, said field insulating layer being partially embedded in said major surface of said substrate and being formed entirely on said wiring channel forming portion and selectively on said basic cell forming portion so as to surround each of said impurity regions of said basic circuit element;

a first insulating film having a first thickness and formed on said field insulating layer formed on said wiring channel forming portion without extending onto said basic cell forming portion, said first insulating film extending in said first direction with a constant width; and

a wiring structure including mutual wirings formed of a first level conductive layer, internal wirings formed of said first level conductive layer, and interconnecting wirings formed of a second level conductive layer higher than that of said first level conductive layer,

each of said mutual wirings being formed only on said first insulating film formed on said wiring channel forming portion and extending in said first direction and being connected to said impurity regions through said interconnecting and internal wirings,

each of said internal wirings being formed only on said basic cell forming portion and being connected to one of said impurity regions without interposing any other wiring, and

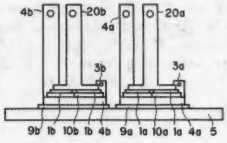
each of said interconnecting wirings connecting an internal wiring on said basic cell forming portion with a mutual wiring on said wiring channel forming portion and extending in a second direction perpendicular to said first direction.

4,984,051

SEMICONDUCTOR DEVICE HAVING DIRECTLY CONNECTED SOURCE TERMINAL

Shigekazu Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,053
Claims priority, application Japan, May 8, 1987, 62-112917
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—42 5 Claims



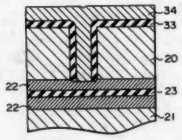
1. A semiconductor device comprising:
a MOSFET chip having one surface on which a gate electrode and a source electrode are provided and another surface on which a drain electrode is provided; and
a source terminal connected to said source electrode of said MOSFET chip and being placed on said source electrode so as to substantially cover said source electrode.

4,984,052

BONDED SUBSTRATE OF SEMICONDUCTOR ELEMENTS HAVING A HIGH WITHSTAND VOLTAGE

Yutaka Koshino; Yoshiro Baba, both of Yokohama; Akihiko Osawa, Machida, and Satoshi Yanagiya, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 10, 1989, Ser. No. 418,587
Claims priority, application Japan, Oct. 13, 1988, 63-257681
Int. Cl.[5] H01L 27/120, 27/20, 29/40
U.S. Cl. 357—49 6 Claims



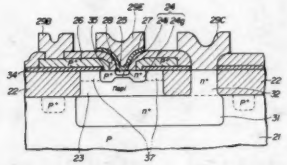
1. A bonded substrate of semiconductor elements having a high withstand voltage, comprising:
a first semiconductor substrate having a plurality of semiconductor elements disposed therein and thereon;
a second semiconductor substrate bonded to a rear surface of the first semiconductor substrate with a first insulating layer provided therebetween;
a first semi-insulating polysilicon layer provided between said first semiconductor substrate and said first insulating layer;
a second semi-insulating polysilicon layer provided between said second semiconductor substrate and said first insulating layer;
a trench formed in the first semiconductor substrate and extending through the first semiconductor substrate to the first semi-insulating polysilicon layer;
a second insulating layer provided on an inner wall of the trench; and
a polysilicon layer provided on the second insulating layer covering the inner wall of the trench.

4,984,053

BIPOLAR TRANSISTOR WITH REDUCED PARASITIC CAPACITANCE

Akio Kayanuma, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,263
Claims priority, application Japan, Apr. 10, 1987, 62-88353
Int. Cl.[5] H01L 27/082, 23/535
U.S. Cl. 357—50 4 Claims



1. A bipolar transistor comprising;
a semiconductor body of second conductivity type with a semiconductor layer of first conductivity type thereon, said semiconductor layer having a major surface,
isolation regions formed adjacent to said major surface and extending through said semiconductor layer to said semiconductor body to laterally surround and define a first semiconductor region of said semiconductor layer of island-shape having first conductivity type adjacent to said major surface,
a second semiconductor region having second conductivity type provided adjacent to said major surface and remote from said isolation regions, said second semiconductor region being formed of a first portion having a predetermined impurity concentration and a second portion along said major surface adjacent to and surrounding said first portion and having higher impurity concentration that said predetermined impurity concentration,
a third region having the first conductivity type formed in said first portion adjacent to said major surface,
wherein the entire surface portion of said first region between said isolation regions and said second portion of said second region is depleted of charge carriers during operation, thereby reducing the capacitance between said second region and said first region.

4,984,054

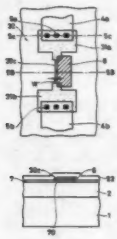
ELECTRIC FUSE FOR A REDUNDANCY CIRCUIT

Michihiro Yamada; Hiroshi Miyamoto; Tadato Yamagata, and Shigeru Mori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 132,619, Nov. 23, 1987, abandoned.
This application Feb. 20, 1990, Ser. No. 481,683
Claims priority, application Japan, Dec. 1, 1986, 61-287331
Int. Cl.[5] H01L 27/12, 27/02, 29/34, 29/06
U.S. Cl. 357—51 32 Claims

13. An electrically blowable fuse for a redundancy circuit for use in replacing defective memory cells with redundancy memory, provided by the steps of:
forming a first insulating film on a semiconductor substrate;
forming an underlying film on a surface of said first insulating film, said underlying film formed between terminal portions of the electrically blowable fuse and defining a longitudinal direction between the terminal portions;
forming a second insulating film on a surface of said first insulating film and a surface of said underlying film to establish a surface stepped portion along an edge of said underlying film; and

forming, for the surface stepped portion, a sidewall of electrically blowable fuse material along an edge of said surface stepped portion in said longitudinal direction defined by said underlying film.



4,984,055

SEMICONDUCTOR DEVICE HAVING A PLURALITY OF CONDUCTIVE LAYERS AND MANUFACTURING METHOD THEREFOR

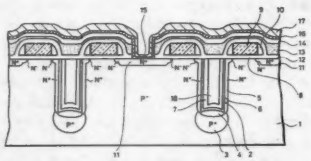
Yoshinori Okumura; Atsuhiro Fujii; Masao Nagatomo; Hiroji Ozaki; Wataru Wakamiya, and Takayuki Matsukawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,103

Claims priority, application Japan, Nov. 25, 1987, 62-298122

Int. Cl.[5] H01L *29/34, 29/68, 29/06*

U.S. Cl. 357—54 **12 Claims**



1. A semiconductor device having a plurality of conductive layers, comprising:

a semiconductor substrate of a first conductivity type, having a major surface;

a plurality of first level conductors formed and disposed to be adjacently spaced apart from one another on said major surface of said semiconductor substrate;

semiconductor regions of a second conductivity type provided in said semiconductor substrate between adjacent ones of said first level conductors;

a multilayer insulation formed of at least three insulating layers positioned over said semiconductor substrate and said first level conductors and having at least one hole formed and selectively located to extend therethrough to reach at least either of one of said semiconductor regions or one of said first level conductors at a bottom surface of said at least one hole;

said hole having a surrounding side wall defined by a corresponding exposed hole-defining surface of each of said at least three insulating layer, said hole-defining surfaces being either flush with or displaced gradually inward of said hole and

a plurality of second level conductors formed as layers over said multilayer insulation and disposed to each extend into said at least one hole to cover said surrounding side wall and said bottom surface of said hole to thereby make conductive contact with the selected one of said semiconductor regions or one of said first level conductors,

wherein said multilayer insulation includes a plurality of oxide layers and an SOG (spin-on-glass) layer, formed by applying a liquid substance containing silicon in the form of a thin film, the SOG layer thus provided becoming sandwiched between two of said oxide layers.

4,984,056

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

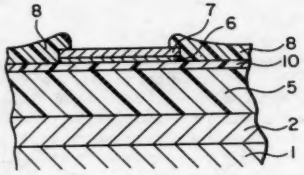
Hitoshi Fujimoto, and Kiyoaki Tsumura, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 14, 1989, Ser. No. 450,455

Claims priority, application Japan, Oct. 13, 1989, 1-265135

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—67 **3 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor substrate;

an oxide film disposed on said semiconductor substrate;

an insulating film disposed on said oxide film;

a tetraethylorthosilicate film disposed on said insulating film;

a titanium nitride film disposed on said tetraethylorthosilicate film;

a bonding pad disposed on said titanium nitride film; and

an insulating protective film disposed on said tetraethylorthosilicate film.

4,984,057

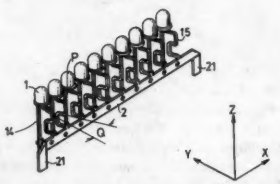
SEMICONDUCTOR ELEMENT STRING STRUCTURE

Adam Mii, 3Fl., No. 1, Fu Hsing N. Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 345,414, May 1, 1989, abandoned. This application Jul. 27, 1990, Ser. No. 558,748

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—68 **1 Claim**



1. A semiconductor element string comprising a transverse plate, and a plurality of semiconductor elements, each of which has a first lead and a second lead mounted on said transverse plate, said first leads being cut off from said transverse plate when said string is to be mounted on a printed circuit board, said second leads being connected to said transverse plate and serving as ground lines for said respective semiconductor elements by bending two distal ends of said transverse plate to be mounted on said printed circuit board; the improvement comprising:

said second leads are bent into a substantially S-shaped structure to reinforce the structure of said semiconductor

element string, each said second lead and its corresponding first lead being located on a first vertical plane which intersects with a second vertical plane passing through a common longitudinal axis of said semiconductor element string by an angle which is not normal to said second vertical plane such that each said second lead of said semiconductor element string is readily accessible for repair.

4,984,058

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

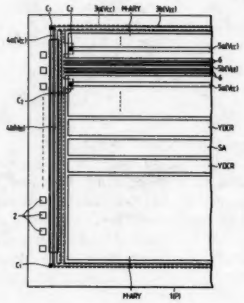
Shuuichi Miyaoka; Nobuo Tamba, both of Ohme; Toshikazu Arai, Maebashi; Hiroshi Higuchi, Takasaki, and Hisayuki Higuchi, Kokubunji, all of Japan, assignors to Hitachi Microcomputer Engineering, Ltd.; Hitachi, Ltd., both of Tokyo and Akita Electronics Co., Ltd., Akita, all of, Japan

Filed Jul. 28, 1988, Ser. No. 225,357

Claims priority, application Japan, Jul. 30, 1987, 62-190974

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—68 **19 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor chip having a main surface;

a plurality of memory cells arranged along row and column directions on said main surface thereby forming rows and columns of memory cells, each of the memory cells being connected to corresponding word and data lines which extend in said column and row directions, respectively;

a first wiring extending in said column direction for supplying a first potential to memory cells which are arranged in said column direction; and

a second wiring extending in said column direction over said plurality of memory cells and comprising a different layer as that of said first wiring, said second wiring being applied with said first potential.

4,984,059

SEMICONDUCTOR DEVICE AND A METHOD FOR FABRICATING THE SAME

Akihiro Kubota, Kawasaki; Rikio Sugiura, Sagamihara; Tsuyoshi Aoki, Kawasaki, and Michio Ono, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 7, 1983, Ser. No. 539,781

Claims priority, application Japan, Oct. 8, 1982, 57-177353

Int. Cl.[5] H01L *23/48, 23/50, 23/28, 23/12*

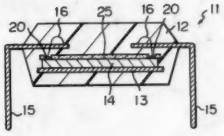
U.S. Cl. 357—68 **10 Claims**

1. A semiconductor device having a molded plastic body, said semiconductor device comprising:

a semiconductor chip having a major surface and having electrodes formed on said major surface, said semiconductor chip being encapsulated in the molded plastic body;

a thin, flat, self-supportive metal stage onto which said semiconductor chip is bonded so that said major surface is opposite to and faces said metal stage, said stage being encapsulated in said molded plastic body;

a plurality of leads, each comprising an inner lead end portion embedded in the molded plastic body and an outer lead end portion extending outside of the molded plastic body, said inner lead end portions of the leads being spaced apart from said semiconductor chips, said inner lead end portion of at least one of the leads overlapping



said stage and extending over said major surface of said semiconductor chip; and

interconnection wires interconnecting each of said inner lead end portions and each of said electrodes of said semiconductor chip.

4,984,060

SEMICONDUCTOR DEVICE WIRINGS WITH HILLOCKS

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Sendai-shi, Miyagi-ken 980; Tadashi Shibata, Miyagi, and Masaru Umeda, Tokyo, all of Japan, assignors to Tadahiro Ohmi, Sendai, Japan

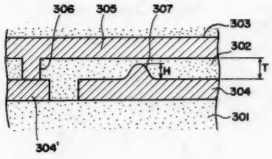
PCT No. PCT/JP88/00972, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989

PCT Filed Sep. 24, 1988, Ser. No. 359,764

Claims priority, application Japan, Sep. 24, 1987, 62-240332

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—68 **2 Claims**



1. A semiconductor device comprising metal wirings, said metal wirings including hillocks on the surfaces thereof, said metal wirings having minimum line widths of 1 μm or less and an interlayer insulating film disposed over said metal wirings, wherein the relationship between the minimum line width W of said metal wirings, the thickness T of said interlayer insulating film, and the height H of said hillocks is expressed by:

$H/T \leq \frac{1}{3}$

$H/W \leq \frac{1}{3}$.

4,984,061

SEMICONDUCTOR DEVICE IN WHICH WIRING LAYER IS FORMED BELOW BONDING PAD

Hiroshi Matsumoto, Hyogo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 10, 1988, Ser. No. 192,665

Claims priority, application Japan, May 15, 1987, 62-116727

Int. Cl.[5] H01L *23/48, 21/88, 23/14*

U.S. Cl. 357—68 **15 Claims**

1. A semiconductor device comprising:

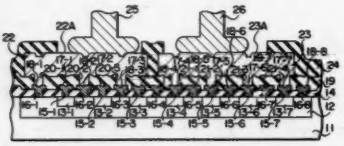
a semiconductor substrate having a major surface including a major surface region;

an active region formed in said major surface region of said semiconductor substrate;

a first insulating layer formed on said major surface of said semiconductor substrate;

a first-tier contact hole formed at a position in said first insulating layer corresponding to said active region;

a metal layer formed in said first-tier contact hole and a portion of said first insulating layer around said first-tier contact hole;



a second insulating layer formed on said metal layer and said first insulating layer;

a second-tier contact hole formed at a position in said second insulating layer corresponding to said metal layer and located above said first-tier contact hole;

a bonding paid formed on a portion of said second insulating layer and filled in said second-tier contact hole; and

a bonding wire connected to regions of said bonding pad located above said first-tier and second -tier contact holes.

4,984,062

PACKAGED SEMICONDUCTOR DEVICE

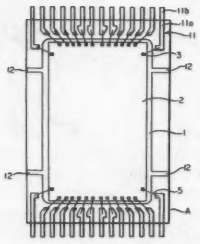
Shunichi Uemura, and Toshinobu Banjo, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 154,321, Feb. 10, 1988, abandoned. This application May 3, 1989, Ser. No. 346,390

Claims priority, application Japan, Mar. 30, 1987, 62-77136

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—70 **5 Claims**



1. A packaged semiconductor device comprising:

a resin package having a generally rectangular shape with a pair of opposed longer sides and a pair of opposed shorter sides;

a semiconductor device contained within said resin package, said semiconductor device having a plurality of terminals oriented along said shorter sides of said resin package;

a pad to which said semiconductor device is bonded within said resin package;

a plurality of leads extending outwardly from the shorter sides of said resin package generally parallel to said longer sides, each lead having an inner end disposed within said package in the vicinity of one of said terminals;

a plurality of lead wires respectively connecting each of said plurality of terminals of said semiconductor device to one of said plurality of leads at said inner end within said resin package; and

two pairs of pad leads extending from said pad for supporting said pad on a frame while said semiconductor device is being bonded to said pad during assembly of said packaged semiconductor device wherein said pad leads are disposed generally parallel to said shorter sides and extend to said longer sides of said packaged device.

4,984,063

SEMICONDUCTOR DEVICE

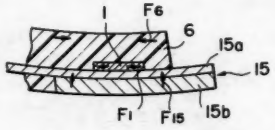
Tomohide Terashima, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 1, 1989, Ser. No. 387,762

Claims priority, application Japan, Mar. 30, 1989, 1-76832

Int. Cl.[5] H01L *23/28, 23/30*

U.S. Cl. 357—72 **23 Claims**



1. A semiconductor device comprising:

a bimetallic chip holding means having opposed first and second surfaces and including first and second metal plates laminated together and having different coefficients of thermal expansion, said first plate being disposed at the first surface and said second plate being disposed at the second surface, said bimetallic chip holding means bending in response to changes in temperature;

a semiconductor chip mounted on the first surface of said chip holding means; and

a molding resin disposed on the first surface of said chip holding means encapsulating said semiconductor chip.

4,984,064

SEMICONDUCTOR DEVICE

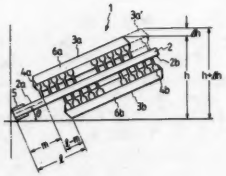
Sugano, Toshio, Kokubunji; Tsukui, Seiichirou, Komoro, and Suzuki, Shigeru, Kokubunji, all of Japan assignors to Hitachi, Ltd. and Hitachi Tobu Semiconductor, Ltd., both of, Japan

Filed Feb. 15, 1989, Ser. No. 310,563

Claims priority, application Japan, Feb. 26, 1988, 63-42071

Int. Cl.[5] H01L *23/12, 23/14, 27/10*

U.S. Cl. 357—80 **13 Claims**



1. A semiconductor device comprising:

a substantially rectangular shaped double-sided board having a first surface and a second surface and a plurality of external electrodes arranged on said first and second surfaces along one of its longer side edge of the board;

a first set of integrated circuit devices mounted on the first surface along said longer side in a row and electrically conducting to said external electrodes on the first surface; and

a second set of integrated circuit devices mounted on the second surface along said longer side in a row and electrically conducting to said external electrodes on the second surface,

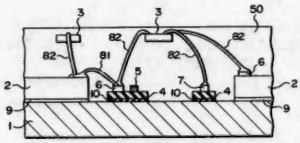
wherein said first set of integrated circuit devices are arranged closer to said longer side edge of the board where said external electrodes are arranged than said second set of integrated circuit devices so that when said double-sided board with said integrated circuit devices is mounted to a substrate at an angle for further electrical connection, said integrated circuit devices mounted to said first side are positioned below the level or at the same level as the other longer edge, thereby lowering the overall dimension of said semiconductor module when mounted to said substrate.

4,984,065

HYBRID RESIN-SEALED SEMICONDUCTOR DEVICE

Shigeki Sako, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 29, 1989, Ser. No. 459,318
Claims priority, application Japan, Jan. 11, 1989, 1-4051
Int. Cl.[5] H01L *23/36, 23/40, 23/48*
U.S. Cl. 357—81 **4 Claims**



1. A hybrid resin-sealed semiconductor device, comprising:

a heat sink on which a plurality of semiconductor chips are mounted;

an insulating substrate secured to the heat sink;

conductive metallic layers formed on the insulating substrate;

electrodes formed on the semiconductor chips;

first thin metallic wires for connecting the electrodes and the conductive metallic layers together;

conductive intermediate members integrally formed with the heat sink and located higher than the heat sink;

second thin metallic wires for connecting the conductive intermediate member to points to which the first thin metallic wires are connected; and

a molding member for sealing and securing the above-mentioned elements.

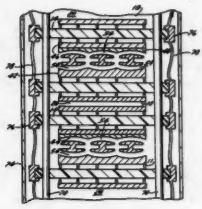
4,984,066

COOLING OF LARGE SEMI-CONDUCTOR DEVICES

Arthur H. Iversen, Saratoga, Calif., assignor to Coriolis Corporation, Saratoga, Calif.

Filed Dec. 12, 1989, Ser. No. 448,873
Int. Cl.[5] H01L *23/34, 23/36, 23/46*
U.S. Cl. 357—82 **20 Claims**

1. A wafer scale semi-conductor module stack comprising at least one wafer scale semi-conductor device mounted on each of the two surfaces of an electrical interconnect substrate, said devices having their active devices facing said substrate with means being provided whereby said substrate and said devices are electrically and mechanically attached, the opposing surface of said devices being the heat exchange surfaces wherein heat is removed by flowing two-phase cooling, and there being multiple substrates positioned parallel to each other and sharing a common axis, each substrate being spaced apart such as to provide a conduit between opposing devices for the flow of coolant and said conduits being fed by an input conduit with coolant discharge through an output conduit, said substrates being attached to common posts, said posts also serving as electrical power sources for said wafers, there further being electrical interconnect means between each of the multiple substrates, and said module stack being enclosed in a sealed



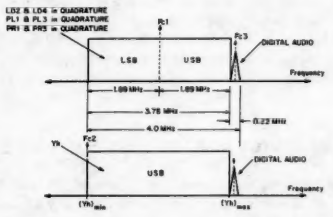
housing flooded with coolant, said housing being provided with means for the input and discharge of coolant through said conduits, external power interconnection means for said posts and external electrical interconnect means for said substrate electrical interconnect means.

4,984,067

HDNTSC SIGNAL TRANSMISSION AND RECEPTION WITH TIME AND FREQUENCY MULTIPLEXING

Alan P. Cavallerano, Ossining; Carlo Basile, Flushing, and Mikhail Tsinberg, Riverdale, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 239,091
Int. Cl.[5] H04N *11/06*
U.S. Cl. 358—12 **17 Claims**



1. A television augmentation apparatus comprising:

means for generating television augmentation signals including line differential signals, panel signals, and luminance signals and a digital signal including audio and synchronization signals;

means coupled to said generating means for time expanding said television augmentation signals;

means coupled to said expanding means for time multiplexing said time expanded line differential signals, said time expanded panel signals, and said time expanded luminance signals, thereby providing a time multiplexed signal comprising said time expanded line differential signals, said time expanded panel signals, and said time expanded luminance signals in respective time intervals; and

means coupled to said generating means and said time multiplexing means for frequency multiplexing said time multiplexed signal and said digital signal, thereby providing a frequency multiplexed signal comprising said time multiplexed signal in a first frequency band and said digital signal in a second frequency band.

4,984,068

MOTION-ADAPTIVE DEVICE FOR SEPARATING LUMINANCE SIGNAL AND COLOR SIGNAL

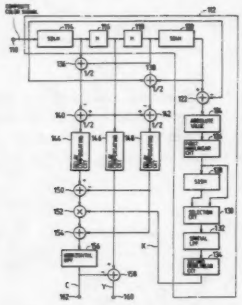
Kenji Sugiyama, Noda; Yasuyuki Katayama, Iwai; Nobuyuki Suzuki; Tomoaki Uchida, both of Noda, and Tatsushi Kouguchi, Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Division of Ser. No. 289,804, Dec. 27, 1988. This application Mar. 6, 1990, Ser. No. 489,167

Claims priority, application Japan, Dec. 29, 1987, 62-336121; Dec. 29, 1987, 62-336122; Dec. 29, 1987, 62-336123

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 **10 Claims**



5. A motion detector comprising:

(a) means for deriving a difference between frames of the composite color signal and generating a difference signal representative of the derived difference;

(b) means for deriving an absolute value of the difference signal and generating an absolute value signal representative of the derived absolute value;

(c) a first nonlinear circuit limiting the absolute value signal;

(d) a spatial low pass filter processing an output signal from the first nonlinear circuit; and

(e) a second nonlinear circuit limiting an output signal from the spatial low pass filter and converting the output signal from the spatial low pass filter into the motion signal.

4,984,069

YC SEPARATOR FOR VIDEO SIGNAL PROCESSING CIRCUIT

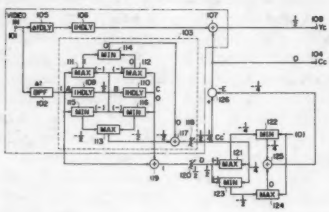
Hiroshi Yamada, Yokohama, and Yasutoshi Matsuo, Kawasaki, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 20, 1988, Ser. No. 260,553

Claims priority, application Japan, Oct. 21, 1987, 62-265887; Oct. 22, 1987, 62-265350

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 **3 Claims**



1. A YC separator for a video signal processing circuit, comprising:

(a) a first circuit (**102**) for separating a chrominance signal A from a composite video signal;

(b) a second circuit (**103**), responsive to said first circuit, for generating a past line chrominance signal A, a present line chrominance signal B and a future line chrominance signal C and generating a chrominance signal Cc' including less unnecessary components on the basis of the three past, present and future line chrominance signals A, B and C;

(c) third circuit means (**119, 120**), responsive to said second circuit, for generating an average signal D of the past and future line chrominance signals A and C;

(d) fourth circuit means (**121–125**), responsive to said second and third circuits, for generating a lower level signal of the average signal D and the chrominance signal Cc'' when the average signal D is the same in sign as the chrominance signal Cc', but a zero-level signal irrespective of levels of these two signals when these two signals are different in sign from each other; and

(e) fifth circuit means (**126**), responsive to said second and fourth circuits, for generating a chrominance signal Cc including much less unnecessary components by subtracting either one of the lower or zero level signal from the chrominance signal Cc' including less unnecessary components.

4,984,070

PICTURE QUALITY IMPROVING APPARATUS CAPABLE OF REDUCING DETERIORATION OF INTERPOLATED SIGNAL

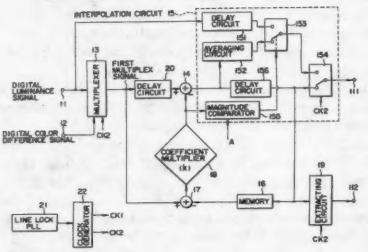
Seiichi Tanaka, Tokyo, and Kouichi Kurihara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 12, 1989, Ser. No. 420,372

Claims priority, application Japan, Oct. 20, 1988, 63-264419

Int. Cl.[5] H04N *9/64, 5/213, 7/18*

U.S. Cl. 358—36 **19 Claims**



1. A picture quality improving apparatus comprising:

multiplexing means for multiplexing first and second digital video signals upon reception thereof and outputting a first multiplex signal containing a noise component;

noise reducing means for reducing said noise component from said first multiplex signal from said multiplexing means and outputting a second multiplex signal;

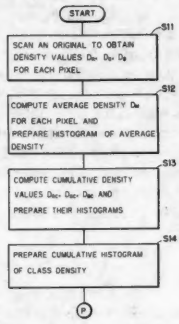
motion detecting means for receiving said first multiplex signal from said multiplexing means and detecting a picture movement signal included in said first multiplex signal; and

interpolating means for generating a first interpolating signal based upon said first digital video signal and a second interpolation signal based upon said second multiplex signal from said noise reducing means, and for interpolating said second multiplex signal using one of said first and second interpolation signals selected in accordance with said picture movement signal detected by said motion detecting means.

4,984,071
METHOD OF AND APPARATUS FOR ESTABLISHING A REFERENCE POINT ON A GRADATION CORRECTION CURVE

Yasuharu Yonezawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Dec. 5, 1989, Ser. No. 446,395
Claims priority, application Japan, Dec. 9, 1988, 63-312684
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—80 **15 Claims**


START
S11
SCAN AN ORIGINAL TO OBTAIN DENSITY VALUES D_R, D_G, D_B FOR EACH PIXEL
S12
COMPUTE AVERAGE DENSITY D_M FOR EACH PIXEL AND PREPARE HISTOGRAM OF AVERAGE DENSITY
S13
COMPUTE CUMULATIVE DENSITY VALUES D_{MC}, D_{MC}, D_{MC} AND PREPARE THEIR HISTOGRAMS
S14
PREPARE CUMULATIVE HISTOGRAM OF CLASS DENSITY
P

1. A method of establishing a reference point on a gradation correction curve employed in gradation correction of image data, said method comprising the steps of:

(a) preparing image data representing density values of a plurality of basic colors with respect to each pixel in an original;

(b) averaging said density values of respective basic colors with respect to each pixel to obtain an average density D_M of each pixel;

(c) generating a histogram representing average density distribution in the form of a relation between said average density D_M and a number of pixels N_p;

(d) generating a cumulative histogram representing said average density distribution in the form of a relation between said average density D_M and a cumulative number of pixels RN;

(e) finding a reference average density D_{Mrf} corresponding to a prescribed value of a reference cumulative number of pixels RN_{rf} on said cumulative histogram;

(f) selecting one of two terminal density values D_{Mn} at which said cumulative histogram saturates and which is closer to said reference average density;

(g) finding a set of pixels having said average density in a range essentially between said reference average density D_{Mrf} and a selected terminal density value D_{Mm};

(h) averaging said density values of said plurality of basic colors for said set of pixels with respect to each of said plurality of basic colors, to thereby obtain reference color density values D_{rf} for respective basic colors; and

(i) establishing said reference point on the basis of said reference color density values D_{rf}.

4,984,072
SYSTEM AND METHOD FOR COLOR IMAGE ENHANCEMENT

Barry B. Sandrew, Encinitas, Calif., assignor to American Film Technologies, Inc., Wayne, Pa.

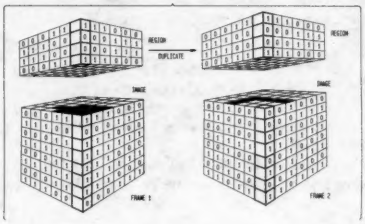
Continuation-in-part of Ser. No. 81,116, Aug. 3, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 222,543
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—81 **37 Claims**

1. A method of color enhancing an image comprising the steps of:

a. capturing the image digitally, as a series of picture elements, each having a gray-scale value representative of its brightness;

b. defining on or more masks, each comprising one or more closed regions of picture elements representative of one or more operator-perceived objects within the image having the same operator-designated hue;

c. defining a color transfer function for each of said masks identifying each of said picture element gray-scale values within each of said masks with a unique combination of hue, luminance, and saturation values;



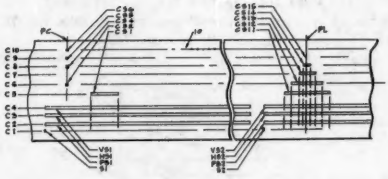
d. applying said color transfer function for each of said masks to said corresponding picture element gray-scale values, thereby deriving unique combinations of hue, saturation, and luminance values corresponding to each gray-scale value; and

e. assigning said derived hue, saturation, and luminance values to said picture elements corresponding to each of said masks.

4,984,073
METHODS AND SYSTEMS FOR SCANNING AND INSPECTING IMAGES

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation of Ser. No. 723,183, Apr. 15, 1985, Pat. No. 4,660,086, which is a continuation of Ser. No. 394,946, Jul. 2, 1982, Pat. No. 4,511,918, which is a division of Ser. No. 13,608, Feb. 16, 1979, Pat. No. 4,338,626, which is a division of Ser. No. 778,331, Mar. 16, 1977, Pat. No. 4,148,061, which is a continuation of Ser. No. 254,710, May 18, 1972, Pat. No. 4,118,730, which is a continuation-in-part of Ser. No. 267,377, Mar. 11, 1963, abandoned, which is a continuation-in-part of Ser. No. 626,211, Dec. 4, 1956, Pat. No. 3,081,379, and Ser. No. 477,467, Dec. 24, 1954, abandoned. This application Sep. 15, 1986, Ser. No. 906,969
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—93 **20 Claims**



1. A method for inspecting an image field to determine if discrete image shapes are present in said image field, comprising:

(a) scanning an image field containing a plurality of discrete image shapes represented by optically contrasting image

portions which are detectable with an electro-optical scanning means,

(b) generating first electrical signals which vary in accordance with variations in the optical characteristics of the image field scanned,

(c) analyzing said first electrical signals and generating first information signals corresponding to the optical characteristics of the image field scanned,

(d) electrically comparing said first information signals with signals from recordings in a memory which are indicative of said discrete image shapes, and

(e) generating digital signals indicative of the presence of said discrete image shapes in said scanned image field each time a discrete image shape is scanned.

4,984,074

MOTION VECTOR DETECTOR

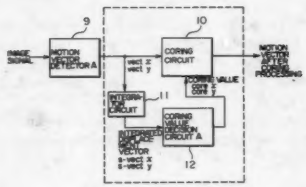
Kenya Uomori, Katano, and Atsushi Morimura, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 13, 1990, Ser. No. 492,742

Claims priority, application Japan, Mar. 20, 1989, 1-068207

Int. Cl.[5] H04N 7/18

U.S. Cl. 358—105 **3 Claims**



1. A motion vector detector comprising:

a motion vector computing circuit for achieving a computation of a motion vector associated with an input image signal;

an integrator circuit for integrating the motion vector;

a coring value decision circuit for deciding a coring value based on an output from said integrator circuit; and

a coring circuit of which a coring value is controlled by an output from said coring decision circuit and which accomplishes a coring operation on an output from said motion vector computing circuit.

4,984,075

CONTOUR DETECTING APPARATUS

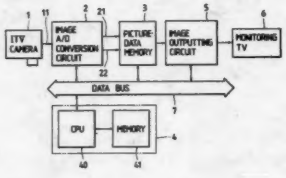
Yutaka Munaoka, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 18, 1989, Ser. No. 381,188

Claims priority, application Japan, Jul. 18, 1988, 63-178791

Int. Cl.[5] H04N 7/18, 7/00

U.S. Cl. 358—107 **6 Claims**



1. A contour detecting apparatus comprising:

a picture-data input device for the input of data on a picture including an object to be detected;

video-signal generating means for scanning the data on the picture and generating video signals each corresponding to luminance of each pixel of the picture;

picture-data memory means for sampling the video signals corresponding to each of two-dimensional coordinates of the pixels and storing as a picture the sampled video-signals; and

contour detecting means for moving relative to the picture stored in said picture data memory means a pair of a first picture section and a second picture section, said second picture section being arranged to be apart by a predetermined distance from and placed in parallel with the first picture section, said contour detecting means detecting the position of the first and second picture section in a case where an absolute value of a difference between a first sum of the video signals stored in said picture-data memory means corresponding to the pixels in the first picture section and a second sum of the video signals stored in said picture-data memory means corresponding to the pixels in the second picture section is a maximum value.

4,984,076

IMAGE COMPRESSION CODING SYSTEM

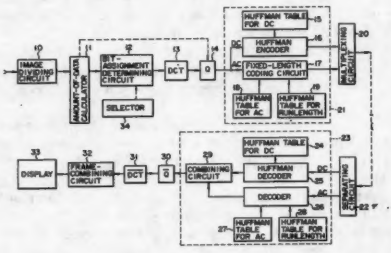
Toshiaki Watanabe, Kawasaki, and Fumio Sugiyama, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1989, Ser. No. 385,437

Claims priority, application Japan, Jul. 27, 1988, 63-185513; Sep. 12, 1988, 63-226415; Dec. 13, 1988, 63-312909; Jan. 10, 1989, 1-1981

Int. Cl.[5] H04N 7/12, 11/06

U.S. Cl. 358—133 **25 Claims**



1. An image coding apparatus comprising:

image dividing means for dividing an image signal of a predetermined unit into a plurality of blocks;

amount of-data calculating means, coupled to said image dividing means, for computing an amount of data representing fineness of a picture and included in each of said blocks;

bit-assignment determining means, coupled to said amount-of-data calculating means, for determining a number of coding bits to be used to assign a predetermined total number of coding bits allowable for encoding said image signal of said predetermined unit to each of said blocks in accordance with said amount of data of said each blocks;

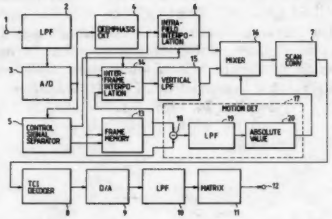
quantizing means for quantizing said image signal for each of said blocks and outputting a quantization block signal; and

encoding means, coupled to said quantizing means, for encoding said quantization block signal in accordance with said determined number of coding bits.

4,984,077
SIGNAL CONVERTING APPARATUS

Tomoaki Uchida, Noda, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Dec. 28, 1989, Ser. No. 456,662
Claims priority, application Japan, Dec. 28, 1988, 63-331298
Int. Cl.[5] H04N 7/12, 11/02
U.S. Cl. 358—140 **5 Claims**



1. A signal converting apparatus comprising:

an analog-to-digital converter converting a MUSE television signal into a corresponding digital signal and outputting said digital signal;

a deemphasis circuit subjecting the output signal from the analog-to-digital converter to a deemphasis process;

a frame memory delaying an output signal from the deemphasis circuit by a time corresponding to one frame;

an intra-field interpolation circuit subjecting the output signal from the deemphasis circuit to an intra-field interpolation process;

an inter-frame interpolation circuit subjecting the output signal from the deemphasis circuit to an inter-frame interpolation process;

a vertical low pass filter removing components from an output signal of the inter-frame interpolation circuit, said components having vertical frequencies equal to and close to N/2 cpH, where N is the number of horizontal scanning lines per frame of the MUSE television signal;

a motion detector deriving a difference signal from the output signal of the deemphasis circuit and an output signal from the frame memory, said difference signal representing a difference between frames, the motion detector including a low pass filter acting on the difference signal, and means for deriving an absolute value of an output signal of said low pass filter to detect a motion;

a mixer mixing an output signal from the intra-field interpolation circuit and an output signal from the vertical low pass filter, the mixing rate of the output signal from the intra-field interpolation circuit and the output signal from the vertical low pass filter being varied in response to the difference signal from the motion detector; and

a scan converter converting an output signal from the mixer into a signal of a predetermined scan format.

4,984,078
SINGLE CHANNEL NTSC COMPATIBLE EDTV SYSTEM

Kenneth R. Skinner, Jefferson City, Tenn., and Joseph P. Bingham, Indianapolis, Ind., assignors to North American Philips Corporation, New York, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,740
Int. Cl.[5] H04N 7/01, 7/04, 11/20, 11/06
U.S. Cl. 358—141 **3 Claims**

1. A vertical expander and filter apparatus comprising:

input means for receiving a television picture signal comprising a plurality of input video lines;

output means for producing, for a group of M of said input video lines, M+1 output video lines, where M is a number,

wherein said output means comprises:

(a) a first divider circuit having a first coefficient;

(b) second and third divider circuits having second and third coefficients respectively;

(c) fourth and fifth divider circuits having fourth and fifth coefficients respectively;

(d) a first line delay circuit for providing a first delayed video line from a first input video line;

(e) a second line delay circuit for providing a second delayed video line from a second input video line;

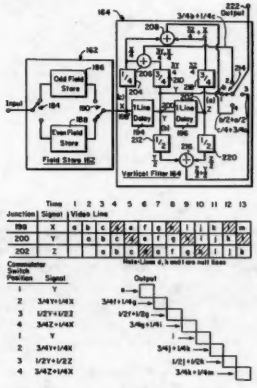
(f) first, second and third adder circuits;

(g) a switch comprising first, second, third and fourth terminals; and

(h) circuit means for interconnecting said divider circuits, said delay circuits and said adder circuits, whereby:

a third input video line is applied to said first line delay circuit and said first divider circuit;

said first delayed video line is applied from said first line



delay circuit to said second line delay circuit, said second divider circuit, said fourth divider circuit and said first terminal of said switch;

said second delayed video line is applied from said second delay circuit to said third divider circuit and said fifth divider circuit;

an output of said first divider circuit and an output of said second divider circuit are applied to said first adder circuit so as to provide a first weighted video line which is applied to a second terminal of said switch;

an output of said fourth divider circuit and an output of said fifth divider circuit are applied to said second adder circuit so as to provide a second weighted video line which is applied to said third terminal of said switch; and

an output of said first divider circuit and an output of said third divider circuit are applied to said third adder circuit so as to provide a third weighted video line which is applied to said fourth terminal of said switch.

4,984,079
VIDEO PREAMPLIFIER CIRCUIT

Keese Ho, Westminster; Bruce R. Ferguson, Tustin, and Gregory J. Sandoval, San Diego, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 26, 1989, Ser. No. 386,384
Int. Cl.[5] H04N 5/14
U.S. Cl. 358—160 **12 Claims**

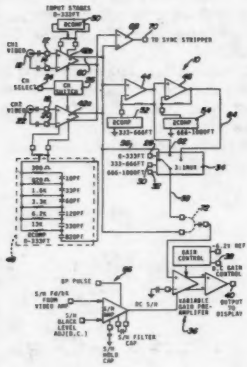
1. A high speed, variable gain video preamplifier circuit for amplifying video signals carried by a cable of a given length, the preamplifier circuit having an output for coupling the preamplified signals to a raster scan video display, said preamplifier circuit comprising:

an integrated circuit device including:

at least one output pad for connection to the video display;

selection means having at least one input pad for receiving information relating to the length of the cable;

cable compensation means for selectively providing increased gain to the received video signal to compensate for the attenuation of the video signal due to the length of



cable, said compensation means including at least one amplifier and a compensation circuit for providing a predetermined gain to the at least one amplifier; and

variable gain amplifier means coupled between the cable compensation means and said output pad for amplifying the compensated signal from the cable compensation means.

4,984,080

VIDEO IF SIGNAL DETECTOR

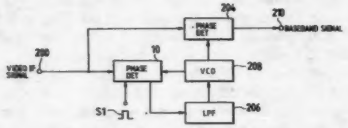
Yukio Nishizawa, Kawaguchi, and Kazuo Urata, Noda, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 18, 1989, Ser. No. 453,272

Claims priority, application Japan, Dec. 27, 1988, 63-331348

Int. Cl.[5] H04N *5/14, 5/44*

U.S. Cl. 358—160 **6 Claims**



1. A video IF signal detector comprising:

a first phase detector detecting a phase difference between an input video IF signal and a first reference signal;

a low pass filter acting on an output signal from the first phase detector;

a VCO generating the first reference signal and a second reference signal in response to an output signal from the low pass filter, the first reference signal and the second reference signal having a fixed phase relation with each other;

wherein the first phase detector, the low pass filter, and the VCO compose a PLL;

a second phase detector detecting a phase difference between the input video IF signal and the second reference signal and extracting a baseband video signal from the input video IF signal; and

PLL control means for enabling the PLL during a first period where the input video IF signal is independent of display information, and for disabling the PLL during a second period where the input video IF signal represents the display information.

4,984,081

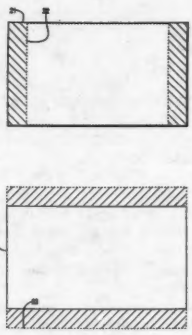
APPARATUS FOR RECEIVING AND SELECTING HIGH-DEFINITION TELEVISION (HDTV) SIGNALS AND STANDARD TELEVISION (NTSC) SIGNALS

Toshihiro Miyoshi, Osaka; Masahiro Kawashima, Takatsuki; Hideyuki Ikuhara, Suita; Tetsuo Kutsuki, Toyonaka, and Kazuyasu Yamamoto, Minoo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 24, 1989, Ser. No. 301,034

Int. Cl.[5] H04N *5/46, 7/01, 3/27*

U.S. Cl. 358—180 **1 Claim**



1. An apparatus for receiving and selecting high-definition television signals and NTSC standard television signals, said apparatus comprising:

a first input terminal for receiving the NTSC standard television signals;

a second input terminal for receiving the high-definition television signals;

a high-definition display screen device having a first aspect ratio of 16 to 9;

the NTSC standard television signals corresponding to a second aspect ratio which is different than said first aspect ratio of said high-definition display screen device;

a first signal converter, coupled to said first input terminal, for converting the NTSC standard television signals into first quasi-high-definition television signals identifying a first displayed image corresponding in vertical length to a vertical length of said high-definition display screen device;

a second signal converter, coupled to said first input terminal, for converting the NTSC standard television signals into second quasi-high-definition television signals identifying a second displayed image corresponding in horizontal length to a horizontal length of the high-definition display screen device;

first switching means, coupled to said first and second signal converters, for selecting and outputting one of said first and second quasi-high-definition television signals; and,

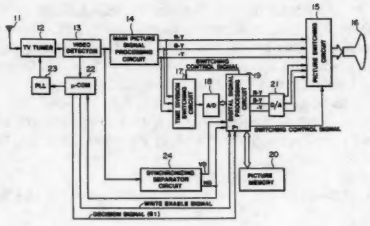
second switching means, coupled to said first switching means and said second input terminal and said high-definition display screen device, for selecting and outputting to said high-definition display screen device one of said high-definition television signals and said one of said first and second quasi-high-definition television signals selected and outputted by said switching means.

4,984,082

CIRCUIT FOR DISPLAYING PICTURE OF MULTIPLE CHANNELS

Masatomo Okamura, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1989, Ser. No. 370,008
Claims priority, application Japan, Jun. 29, 1988, 63-162917
Int. Cl.[5] H04N 5/272, 5/450
U.S. Cl. 358—183 6 Claims



1. A circuit for displaying pictures of multiple channels, comprising:

television-signal receiving means arranged to receive a television broadcasting signal and then to output a signal which has been subjected to video detection;

a picture memory for storing signal information obtained by sequentially receiving broadcasting signals of a corresponding plurality of channels in a time-division fashion;

synchronizing separator means for separating a synchronizing signal containing a horizontal synchronizing signal component from said video-detected signal;

decision-making means for outputting a write enable signal and a decision signal representing a decision as to the presence of absence of each of said received broadcasting signals within said corresponding plurality of channels, said decision-making means utilizing said horizontal synchronizing signal component to thereby output said decision signal, said decision signal when output in the presence of said broadcasting signal differing from said decision signal when output in the absence of said broadcasting signal;

picture memory controlling means for writing said signal information into said picture memory in response to said write enable signal, said picture memory controlling means including an address counter for providing access to said picture memory and means for generating a clock signal for use in said address counter, said means for generating said clock signal being responsive to said decision signal and generating a clock signal of first frequency to said address counter in the presence of said broadcasting signal and a clock signal of second frequency higher than said first frequency to said address counter in the absence of said broadcasting signal; and

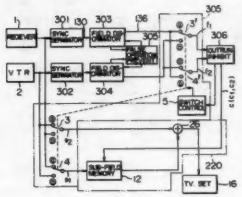
display means capable of displaying pictures of said plurality of channels on the basis of said signal information read from said picture memory.

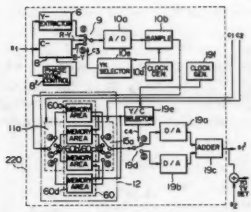
4,984,083

IMAGE PROCESSING SYSTEM

Kaneyuki Okamoto; Hideo Nishijima; Michio Masuda; Hiroyasu Ohtsubo, and Koichi Ono, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 47,156, May 8, 1987, abandoned. This application Jun. 28, 1989, Ser. No. 373,630
Claims priority, application Japan, May 12, 1986, 61-106609; May 19, 1986, 61-112604
Int. Cl.[5] H04N 5/45
U.S. Cl. 358—183 3 Claims





1. An image processing system comprising:

a memory which is capable of storing four fields of sub-field video signals;

field discriminating means which discriminate odd-numbered and even-numbered fields of the sub-field video signals;

divider means for diving the discriminated sub-field video signals;

field discrimination means which discriminate odd-numbered and even-numbered fields of main-field video signals;

displaying period control means which outputs a displaying period signal of the sub-field video signals;

merging means which merges main-field video signals or sub-field video signals to output in accordance with the controlled displaying period signal;

write address control means for deciding an address area in the memory to write information in accordance with the discriminated sub-field video signals and the divided sub-field video signals and;

read address control means for deciding the read address area in the memory according to said discriminated main-field video signals, the displaying period signal and said divided sub-field video signals.

4,984,084

VIDEO CAMERA

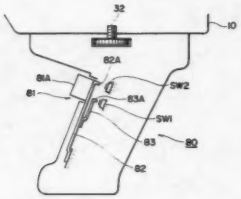
Hidemi Sasaki; Yoshiaki Nakayama; Katsuya Inana; Kozo Kokubun; Kazuhiro Tokuda, and Mikio Utsugi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 368,731, Jun. 20, 1989. This application Aug. 29, 1990, Ser. No. 574,189

Claims priority, application Japan, Jun. 20, 1988, 63-151975; Jun. 30, 1988, 63-163666; Jul. 4, 1988, 63-167438; Dec. 15, 1988, 63-316774

Int. Cl.[5] H04N *5/30*

U.S. Cl. 398—209 10 Claims



1. A video camera comprising:

a first photographing button disposed in a main body of said video camera for instructing alternately the start and stop of photographing each time said button is operated;

an under grip mountable removably to the bottom portion of said video camera main body;

a second photographing button disposed in said under grip for instructing the start of photographing only when said button is operated; and,

means, responsive to the mounting of said under grip to said video camera main body or to the electrical connection between said under grip and video camera main body, for prohibiting the start of photographing by said first photographing button.

4,984,085

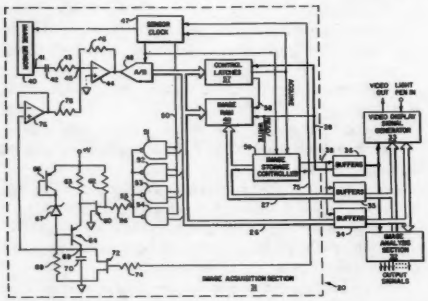
IMAGE PROCESSOR WITH DARK CURRENT COMPENSATION

Roger W. Landowski, Waukesha, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Aug. 3, 1989, Ser. No. 388,884

Int. Cl.[5] H04N *3/14, 5/335*

U.S. Cl. 358—213.16 11 Claims



1. A system which compensates for dark current in a signal from an image sensor comprises:

means for digitizing the image sensor signal into a series of multi-bit numbers;

a logic circuit for detecting when any one of a plurality of bits of a multi-bit digital number from said means for digitizing has a given logic level and producing an output signal indicative thereof;

a voltage storage means;

a switch means, controlled by the output signal of said logic circuit, for applying a voltage to said voltage storage means; and

means for combining voltage from said voltage storage means with the signal from the image sensor.

4,984,086

SCANNER WITH ELECTRONICALLY VARIABLE RASTER TO PRODUCE PICTURE EFFECTS

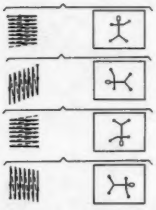
Ronald W. J. Mumford, and Terence W. Mead, both of Hertfordshire, England, assignors to Rank Cintel Ltd., England

Continuation-in-part of Ser. No. 164,523, Mar. 7, 1988, Pat. No. 4,897,729, which is a continuation-in-part of Ser. No. 940,562, Dec. 11, 1986, Pat. No. 4,746,985, which is a continuation-in-part of Ser. No. 722,153, Apr. 11, 1985, Pat. No. 4,694,345. This application Jan. 29, 1990, Ser. No. 471,846

Claims priority, application United Kingdom, Dec. 22, 1989, 8928991

Int. Cl.[5] H04N *3/36*

U.S. Cl. 358—216 18 Claims



1. A method for writing an image represented by a video signal onto a portion of unexposed film comprising the steps of:

introducing a portion of unexposed film into a film gate of a film writer which includes a cathode ray tube (CRT) raster scanner for scanning the film portion;

scanning said unexposed film portion with said cathode ray tube (CRT) raster scanner;

controlling the raster in accordance with the video signal representing the image to be written to expose correctly the unexposed film portion; and

adjusting electronically the angular orientation of the raster of the CRT raster scanner relative to the film portion;

whereby the orientation on the exposed film of the image written by the CRT scanner under control of the video signal is angularly displaced in accordance with the orientation of the raster.

4,984,087

MICROPHONE APPARATUS FOR A VIDEO CAMERA

Katsunori Fujimura; Hiroshi Saitoh, both of Yokohama, and Michio Matsumoto, Sennan, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1989, Ser. No. 358,299

Claims priority, application Japan, May 27, 1988, 63-130675; Sep. 9, 1988, 63-227007

Int. Cl.[5] H04N *5/225*

U.S. Cl. 358—225 15 Claims

1. A microphone apparatus for a video camera having a zoom lens, comprising:

a superdirectional sound pickup means for generating a directional sound pickup signal;

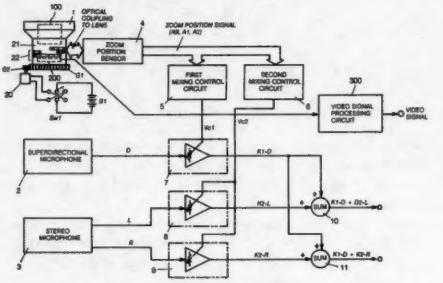
a stereo sound pickup means for generating stereo sound pickup signals;

a zoom position detection means for generating a zoom position signal which corresponds to the zoom position of said zoom lens;

a first signal means for generating a first control signal the value of which is changed according to said zoom position signal;

a second signal means for generating a second control signal the value of which is changed according to said zoom position signal;

a first amplifying means for generating a first amplified signal, said first amplified signal being a product of said superdirectional sound pickup signal and a value which corresponds to said first control signal;



a second amplifying means for generating a second amplified signal, said second amplified signal being a product of one of said stereo sound pickup signals and a value which corresponds to said second control signal;

a third amplifying means for generating a third amplified signal, said third amplified signal being a product of another of said stereo sound pickup signals and a value which corresponds to said second control signal;

a first adding means for generating a first sum signal which is the sum of said first amplified signal and said second amplified signal; and

a second adding means for generating a second sum signal which is the sum of said first amplified signal and said third amplified signal.

4,984,088

EXPOSURE CONTROLLING APPARATUS FOR ELECTRONIC STILL CAMERA

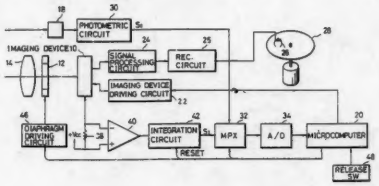
Nobuhiro Tani, Tokyo, and Harumi Aoki, Saitama, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 248,390, Sep. 23, 1988, Pat. No. 4,868,667, and a continuation-in-part of Ser. No. 381,185, Jul. 18, 1989. This application Sep. 11, 1989, Ser. No. 405,194

Claims priority, application Japan, Sep. 25, 1987, 62-241545

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—228 **15 Claims**



1. An exposure controlling apparatus for an electronic still camera, comprising:

means for metering the brightness of a subject and for outputting a photometric value thereof as a first photometric value;

means for automatically setting either an aperture value or a shutter speed that is not manually set, on the basis of said first photometric value;

an imaging device having a plurality of light receiving elements for effecting photoelectric conversion which are arranged in the form of a matrix;

an electronic shutter for controlling a charge accumulation time by said light receiving elements of said imaging device on the basis of said shutter speed as set;

means for adjusting a cross-sectional area of a bundle of rays incident upon a light receiving surface of said imaging device in such a manner that a set aperture value will be attained;

means for effecting preliminary photographing at said aperture value and said shutter speed set by controlling said electronic shutter and said adjusting means, for detecting a total amount of charge accumulated in at least a part of said light receiving elements of said imaging device, and for outputting a value that is proportional to said total amount of charge as a second photometric value; and

means for correcting said shutter speed in such a manner that an exposure error attributable to an aperture control deviation and any error in said first photometric value becomes zero by using said second photometric value.

4,984,089

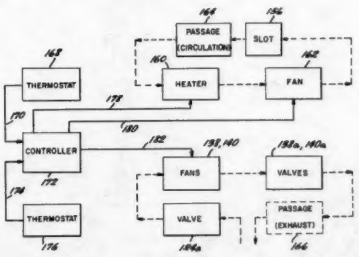
OUTDOOR SURVEILLANCE DOME WITH ENHANCED ENVIRONMENTAL APTITUDE AND CONTROL SYSTEM THEREFOR

Norbert M. Stiepel, Coral Springs; Edwin Thompson, Loxahatchee, and Luis Anderson, Boca Raton, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Jan. 8, 1990, Ser. No. 462,007

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—229 **16 Claims**



8. In combination, in an outdoor surveillance apparatus of the type including upper and lower dome-shaped assemblies, supporting therewithin a camera for rotational and tilting movements, said upper assembly including a sunshield and a housing within said sunshield, said lower assembly including a light transmissive outer member and an opaque shroud within said outer member, said shroud including a slot for providing optical communication for said camera therethrough:

(a) first flow communication passage means between said slot and said lower assembly outer member;

(b) second flow communication passage means between said sunshield and said housing and open to ambient environment;

(c) first fan means for flow communication with said first flow communication passage;

(d) second fan means for flow communication with said second flow communication passage means;

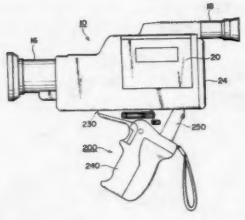
(e) valve means operable for providing access for said second fan means to said second flow communication passage means for intake of ambient medium to said apparatus and exhaust of said ambient medium to ambient environment;
(f) heater means in flow communication with said first fan means;
(g) thermostat means for sensing respective predetermined low and high temperatures in said apparatus; and
(h) control means for operating said first fan means continuously during use of said apparatus, for operating said second fan means selectively on sensing of said predetermined high temperature, and for operating said heater means selectively upon sensing of said predetermined low temperature.

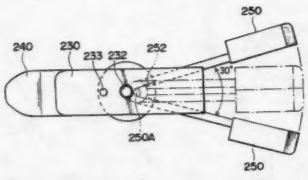
4,984,090

TRIPOD-CONTAINING GRIP FOR USE WITH A VIDEO CAMERA

Hidemi Sasaki; Yoshiaki Nakayama; Katsuya Inana; Kozo Kokubun; Kazuhiro Tokuda, and Mikio Utsugi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1989, Ser. No. 368,731
Claims priority, application Japan, Jun. 20, 1988, 63-151975; Jun. 30, 1988, 63-163666; Jul. 4, 1988, 63-167438; Dec. 15, 1988, 63-316774
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—229 **2 Claims**





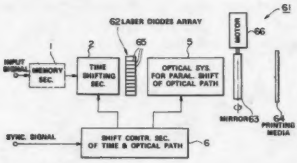
1. A tripod containing grip comprising:
a grip main body which can be rotatably mounted to the bottom portion of a main body of a video camera and the angle of which can be fixed at a first angle when said grip main body is used as a grip and at a second angle further inclined toward the front portion of said video camera than said first angle when said grip main body is used as a tripod; and,
a pair of right and left leg portions at least parts of which can be slidably stored within said grip main body in the longitudinal direction of said grip main body, and which can be pulled out from the rear portion of said grip main body when said grip main body is used as tripod and can be opened to a predetermined angle.

4,984,091

APPARATUS FOR PHOTOGRAPHING OR PROJECTING AN IMAGE FOR A CRT OR LASER DIODE ARRAY

Masanao Murata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,741
Claims priority, application Japan, May 29, 1987, 62-136980
Int. Cl.[5] H04N *5/84*
U.S. Cl. 358—244 **12 Claims**



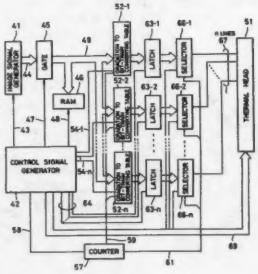
1. An apparatus for photographing an image, comprising:
time shifting means for effecting stepwise time-shifting of the time of one of an input video signal and a synchronizing signal;
image displaying means for displaying said video signal a plurality of times, each time stepwise time-shifted by said time shifting means on a display screen in the form of an image;
a focusing optical system for focusing each said image displayed by said image displaying means;
a recording medium disposed with a sensitizing surface thereof located in a focal plane of said focusing optical system for recording each stepwise time-shifted image; and
a position shifting means for stepwise shifting, in synchronization with said stepwise time-shifting, a relative position of an image formed on said recording medium with respect to a position of said image displayed by said image displaying means.

4,984,092

HALFTONE IMAGE GRADATION DATA CONVERTED TO BIT-TRAIN DATA WITH DATA RETAINED AFTER THRESHOLDING CONVERTED TO PULSE-TRAIN DATA

Nobuhisa Kato, and Fujio Moriguchi, both of Iwatsuki, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,209
Claims priority, application Japan, May 24, 1988, 63-126286
Int. Cl.[5] H04N *1/23*; G01D *15/10*; B41J *2/315*
U.S. Cl. 358—298 **15 Claims**



1. An image recording apparatus for recording a halftone image by controlling a heat energy of a heating element pro-

vided corresponding to each picture element by a number of pulses based on gradation data representing a gradation within each picture element for an image, the image recording apparatus comprising:

gradation to bit-train converting means for converting the gradation data into a train of bits corresponding to the gradation data and, when receiving gradation data indicative of a gradation in excess of a predetermined gradation, for converting the gradation data into a train of bits whose bit pattern is discontinuous subsequent to outputting of a train of bits corresponding to the predetermined gradation; and

bit-train to pulse-train converting means for converting the converted and outputted bit-train into a train of pulses time sequentially arrayed, and applying the converted pulse train to the heating element provided corresponding to the picture element.

4,984,093

VIDEO RECORDER WITH INCREASED BANDWIDTH RECORDING

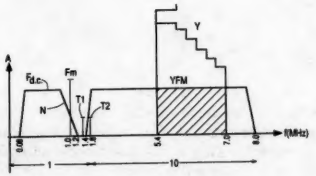
Burchard Schmidtmann, Villingen, and Silvestre Cerda-Davo, Toledo, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 242,836

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731166

Int. Cl.[5] H04N *9/83*

U.S. Cl. 358—330 **11 Claims**



1. Video recording apparatus, comprising:

a source of a luminance containing signal;

means for frequency modulating said luminance containing signal with an FM carrier to generate a frequency modulated signal having a first frequency spectrum in a first frequency band;

a source of a chrominance containing signal;

means including a modulator for modulating said chrominance containing signal with a second carrier to generate a second modulated signal having a second frequency spectrum that is located in a second frequency band below said first frequency band in a region that is generally empty of frequencies belonging to said frequency modulated signal, said second frequency spectrum including a band of upper sidebands and a band of lower sidebands with respect to said second carrier frequency having a corresponding pair of upper and lower cut-off frequencies such that one of said upper and lower cut-off frequencies is substantially closer to said second carrier frequency than the other one; and

means for combination and recording said frequency and second modulated signals on a magnetic tape.

4,984,094

HIGH DEFINATION VIDEO SIGNAL RECORDING SYSTEM

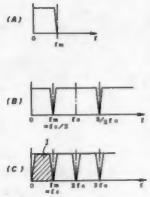
Takahisa Emori, Tokyo, Japan, assignor to Tatsu Corporation Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,214

Claims priority, application Japan, Jul. 8, 1987, 62-170516

Int. Cl.[5] H04N *5/92*

U.S. Cl. 358—335 **4 Claims**



1. A method for recording a video signal arranged as a repetition of a number of fields with a predetermined number of horizontal scanning lines in each of the fields and having a maximum signal frequency on a recording medium having a maximum recording frequency, said maximum signal frequency being higher than the maximum recording frequency but lower than a predetermined frequency which is twice as large as the maximum recording frequency, comprising the steps of:

sampling the video signal with a first sampling frequency set lower than the predetermined frequency but higher than the maximum signal frequency for each consecutive repetition of first through fourth fields of the video signal for producing first through fourth sampled video signals respectively corresponding to the first through fourth fields for each consecutive repetition of the first through fourth fields of the video signal;

performing said sampling, in each repetition of the first through fourth fields, with a timing such that the timing of sampling performed on each scanning line in the first field is offset with respect to the timing of sampling performed on the corresponding scanning line in the third field and such that the timing of sampling in the second field is offset with respect to the timing of sampling in the fourth field;

eliminating a frequency component higher in frequency than one-half of the sampling frequency from the first through fourth sampled video signals; and

recording the first through fourth sampled video signals, after the step of eliminating the frequency component, on the recording medium consecutively for each repetition of the first through fourth fields.

4,984,095

VIDEO SIGNAL PROCESSING APPARATUS HAVING DELAY MEANS FOR VARIED USES

Makoto Takayama, Kanagawa; Tsuguhide Sakata, and Tomotaka Muramoto, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 17,001, Feb. 19, 1987, abandoned, which is a continuation of Ser. No. 545,750, Oct. 26, 1983, abandoned. This application Feb. 27, 1989, Ser. No. 317,051

Claims priority, application Japan, Oct. 27, 1982, 57-189688

Int. Cl.[5] H04N *5/94*

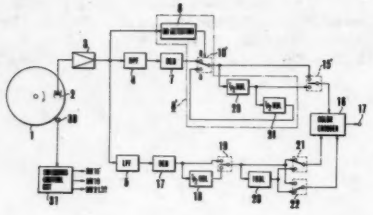
U.S. Cl. 358—336 **22 Claims**

19. A video signal processing device, comprising:

(a) compensating means for compensating a $\frac{1}{2}$ H deviation of a video signal, said compensating means including,

(A) first delay means for delaying a video signal for a substantial half horizontal period; and

(B) first switching means for alternately switching the video signal delayed by said first delay means and a video signal not delayed by said first delay means at a predetermined interval; and



(b) process means for delaying said video signal for a predetermined period longer than said half horizontal period, said process means including second delay means, which is used in cascade relatively to said first delay means.

4,984,096

VIDEO DISK, DISK PLAYER AND METHOD FOR LONG PLAY MODE CONSTANT ANGULAR VELOCITY PLAYBACK

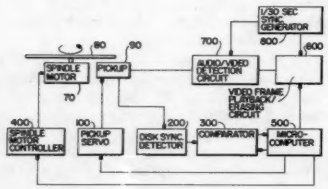
Jin-Nam Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kwonsun, Rep. of Korea

Filed Jun. 23, 1987, Ser. No. 65,391

Claims priority, application Rep. of Korea, Jun. 24, 1986, 86-5023

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—342 **27 Claims**



1. A playback method for use in a constant angular velocity video disk player having a disk with four fields of vertical synchronization signals included for each track on the disk and original audio/video signals in high density recorded in data fields on said track as data, a spindle motor for driving said disk, a pickup to read said original signals from said disk, a pickup servo to control motion of said pickup, a disk synchronization detector for reading synchronization signals from said disk, a spindle motor controller for controlling motions and velocity of said spindle motor, a microcomputer having a control program and a memory for executing playback operation of the disk, a video/audio detection circuit for reading said original video/audio signals from said disk, a comparator which compares a count value of said synchronization signals with preset synchronization data provided from said microcomputer, a video frame playback/erasing circuit for disabling playback of unnecessary frames and enabling playback of necessary frames on said disk in accordance with controls of said microcomputer and a synchronization generator providing synchronization signals of 1/30 second period, said method comprising the steps of:

checking a mode of said disk by reading a disk identifier code of said disk;

detecting said synchronization signals of said disk and thereby counting a number of said fields of vertical synchronization signals per each track of said disk;

comparing said number of fields of vertical synchronization signals to preset synchronization data provided from said microcomputer;

decreasing the revolution velocity of said disk in accordance with controls of said microcomputer if said number of fields of vertical synchronization signals is equal to said preset data;

determining whether a function for displaying still motion on a screen has been selected and thereby disabling playback of said unnecessary frames of said disk in accordance with controls of said microcomputer when said function has been selected; and

displaying on the screen said original video signals which are not recorded in said unnecessary frames.

4,984,097

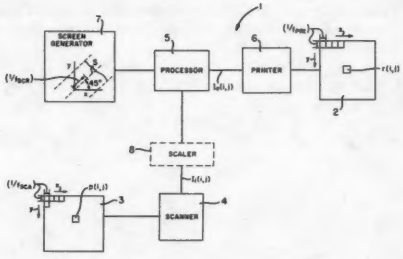
HALFTONE REPRODUCTION WITH ENHANCED GRAY LEVEL REPRODUCIBILITY

Joseph S. Shu, White Plains, N.Y., assignor to Nynex Corporation, New York, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,428

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—429 **30 Claims**



1. A method for use in developing a halftone reproduction of a continuous tone original, the original being scanned at a spatial frequency f_{SCA} in a given scan direction to define pixels of the original at discrete first positions of the original and the halftone reproduction being produced by a printer which prints at a spatial frequency f_{PRI} in a given print direction to produce reproduction pixels which together form halftone dots at a spatial frequency f_{SCR} in a given screen direction and which are capable of exhibiting gray levels over substantially the entire gray level range of 0 (black) to 255 (white), the method comprising:

providing the gray level values of the pixels at the discrete first positions to define first gray level values,

defining a gray level screen function applicable over the pixels of the original, the screen function having said frequency f_{SCR} in said screen direction and said frequency f_{SCR} being selected such that the frequency f'_{SCR} of the screen function in the print direction is other than a submultiple of the print frequency f_{PRI};

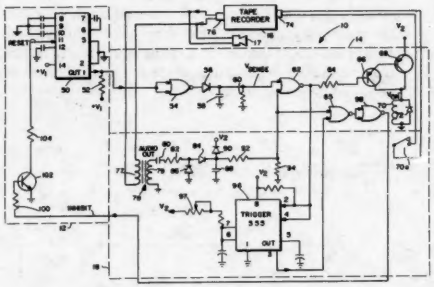
determining the values of the gray level screen function at the discrete first positions only to form second gray level values; and

for each first gray level value which is equal to or less than the second gray level value at the same discrete first position establishing a third gray level value, and for each first gray level value which is greater than the second gray level value at the same discrete first position establishing a fourth gray level value.

4,984,098
POINT OF PURCHASE AUTOMATICALLY-ACTUATED AUDIO ADVERTISING DEVICE AND METHOD

Frank Y. Buntsis, Louisville, Ky., assignor to Popad, Inc., Louisville, Ky.

Filed Aug. 1, 1986, Ser. No. 892,071
Int. Cl.[5] G08B *23/00*; G11B *15/18*
U.S. Cl. 360—12 **7 Claims**



1. A point-of-purchase advertising apparatus of the type adapted to control the operation of a tape recorder, said apparatus comprising:

first detecting means having an enabled state and a disabled state for producing a first electrical output signal in response to a person nearby when in said enabled state, said first detecting means producing no first output signal when in said disabled state;

second detecting means operatively connected to said tape recorder for producing a second electrical output signal whenever said tape recorder is producing audio;

tape recorder control means, operatively connected to said first and second detecting means and to said tape recorder, for activating said tape recorder in response to the presence of any of said first and second output signals and for substantially immediately deactivating said tape recorder in response to the absence of both said first and second output signals; and

a single timing means connected to receive said first and second output signals and connected to control said first detecting means for disabling said first detecting means beginning upon receipt of any of said first and second output signals, said timing means also for timing a preset time interval upon loss of both of said first and second output signals, said timing means continuing to disable said first detecting means whenever either of said first and second output signals are present and thereafter for continuing to disable said first detecting means for the duration of said preset time interval.

4,984,099
APPARATUS FOR DECODING A TRANSMITTED SIGNAL

Keiji Kanota, Kanagawa; Hajime Inoue, Tokyo, and Takahito Seki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

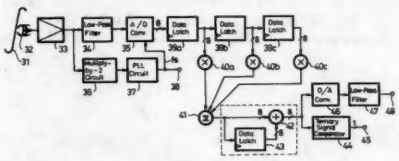
Filed May 19, 1989, Ser. No. 354,031
Claims priority, application Japan, May 25, 1988, 63-127888
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—46 **1 Claim**

1. An apparatus for decoding a transmitted signal, which is precoded in a recording process in accordance with a class IV partial response method, comprising:

receiver means including a magnetic head for receiving said transmitted signal through a magnetic recording medium;

filter means including a low pass filter having a cut-off frequency defined by a Nyquist frequency of said transmitted signal for limiting the frequency of an output signal from said receiver means within a predetermined frequency range and to generate a filtered output signal;

generator means for generating a clock signal with a frequency equal to a transmitting rate of said transmitted signal;



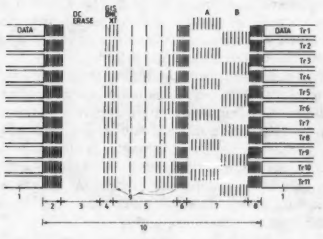
converter means for sampling the filtered output signal at a frequency defined by said clock signal and for converting the filtered output signal into a binary signal; and

process means including a transversal filter acting as an equalizer for decoding said binary signal according to said class IV partial response method.

4,984,100
MAGNETIC DISK APPARATUS

Norikazu Takayama; Nobuyoshi Ushijima; Tetsuzo Kobashi; Masahiko Sato, all of Odawara; Yoshihiko Yano, Hiratuka; Jun Isozaki, Kashiwa; Kousuke Fujii, Koganei, and Yoshinobu Kudoh, Minamiasigara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 14, 1989, Ser. No. 380,199
Claims priority, application Japan, Jul. 15, 1988, 63-175011; Nov. 18, 1988, 63-289990
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—49 **19 Claims**



1. A magnetic disk apparatus comprising:

at least one disk having a plurality of tracks, each track being divided into a plurality of sectors to record data thereon; each sector having written at the head thereof a DC erase signal to indicate the beginning of the sector and a position information signal written thereon to indicate the position of said sector, said position information signal being a signal that indicates with a plurality of bits in Gray code a track number on which said sector is positioned with a dummy bits interleaved between predetermined numbers of bits of said Gray code;

a transducer for writing data onto said disk and reading data and the information at the head of each sector from said disk;

an actuator for positioning said transducer on a predetermined track; and

a microprocessor coupled to receive said data and information which is read and adapted to recognize said position information signal read by said transducer and control the

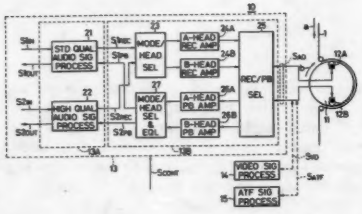
motion of said actuator according to said position information that is recognized.

4,984,101

PCM SIGNAL REPRODUCING APPARATUS

Keiji Kanota, Kanagawa, and Noboru Murabayashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,186
Claims priority, application Japan, Sep. 28, 1987, 62-244835
Int. Cl.[5] G11B 5/03
U.S. Cl. 360—65 8 Claims



1. Data reproducing apparatus for reproducing data that is recorded on a record medium with a selected one of at least two different recording densities, whereby first or second playback data having first or second frequency characteristics, respectively, is picked up, and wherein said record medium is a magnetic medium having a selected one of plural different recording characteristics, comprising:

first equalizer means including first and second equalizer circuits each having equalizing characteristics matched to the first frequency characteristics of the first playback data with said first equalizer circuit having equalizing characteristics additionally matched to one of the recording characteristics of the magnetic medium and said second equalizer circuit having equalizing characteristics additionally matched to another of the recording characteristics of the magnetic medium;

second equalizer means including third and fourth equalizer circuits each having equalizing characteristics matched to the second frequency characteristics of the second playback data with said third equalizer circuit having equalizing characteristics additionally matched to said one recording characteristic of the magnetic and said fourth equalizer circuit having equalizing characteristics additionally matched to said other recording characteristics of the magnetic medium; and

switching means for switching said first or second equalizer means in circuit to process the picked up data as a function of whether said first or second playback data is picked up, thereby reducing a bit error rate of data derived from said first and second equalizer means, respectively.

4,984,102

INFORMATION SIGNAL RECORDING APPARATUS AND APPARATUS FOR REPRODUCING THE SAME

Ryo Fujimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 235,427
Claims priority, application Japan, Aug. 31, 1987, 62-215155; Oct. 16, 1987, 62-261004
Int. Cl.[5] G11B 15/14, 5/02
U.S. Cl. 360—65 19 Claims

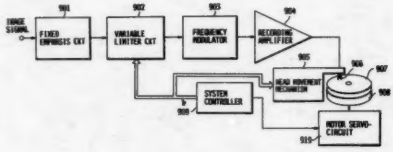
1. An information signal recording apparatus arranged to concentrically form a plurality of recording tracks on a disc-shaped recording medium by recording information signals on said disc-shaped recording medium, comprising:

(a) linear emphasis means arranged to receive an information signal and then to linearly emphasize a predetermined high-band frequency component of said input information signal;

(b) angle modulation means for forming and outputting an angle-modulated information signal by angle-modulating said information signal whose predetermined high-band frequency component has been linearly emphasized by, and supplied from said linear emphasis means;

(c) recording head means arranged to receive said angle-modulated information signal output from said angle modulation means and then to record said angle-modulated information signal on said disc-shaped recording medium;

(d) head movement means for causing said recording heads means to move over said disc-shaped recording medium in the radial direction thereof;



(e) head-position-specifying signal output means for outputting a head-position specifying signal to said head movement means so as to cause said recording head means to move to an arbitrary position in the radial direction of said disc-shaped recording medium;

(f) DC-level signal output means arranged to receive as an input said head-position-specifying signal output from said head-position-specifying signal output means and then to output a DC-level signal corresponding to said input head-position-specifying signal; and

(g) variable level limiting means for limiting the level of said information signal having said predetermined high-band frequency component linearly emphasized by said linear emphasis means, in accordance with said DC-level signal outputted from said DC-level signal output means.

4,984,103

METHOD FOR READING/WRITING FOR A FLOPPY DISC DRIVE WITH BUFFER MEMORY

Anil K. Nigam, Cupertino, Calif., assignor to Fujitsu America, Inc., San Jose, Calif.

Division of Ser. No. 130,104, Dec. 7, 1987, Pat. No. 4,933,795.
This application Mar. 30, 1989, Ser. No. 332,023
Int. Cl.[5] G11B 19/20, 5/09
U.S. Cl. 360—074.100 6 Claims

1. A method for a floppy disc drive in a computer for reducing power consumption and/or speeding data transfer, the method comprising the steps of:

(a) providing a read/write head capable of reading data on a floppy disc;

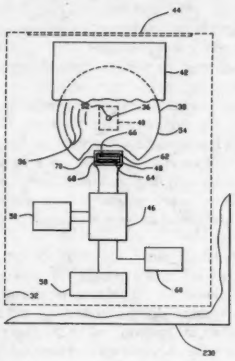
(b) providing a look-ahead memory buffer in the disc drive;

(c) reading requested data and data ahead of the requested data from the disc by the read/write head;

(d) storing the read data ahead of the requested data in the look-ahead memory buffer;

(e) reading the stored data from the look-ahead memory

buffer instead of the disc when a next requested data is the same as the data stored in the memory buffer; and



(f) ceasing movement of the disc until reading of the data stored in the memory buffer is completed or until other data is requested that is needed directly from the disc.

4,984,104

APPARATUS FOR RECORDING AN INFORMAGION SIGNAL AT A SECOND PART OF A GIVEN TRACK BY SAMPLING AND HOLDING A TRACKING CONTROL SIGNAL USED FOR TRACKING AT A FIRST PART OF THE GIVEN TRACK

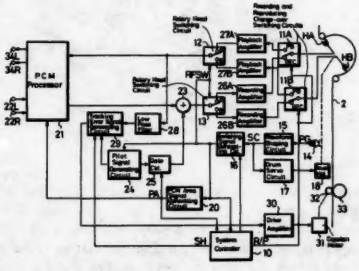
Takao Takahashi, Tokyo, and Kenji Nakano, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 257,136, Oct. 14, 1988, abandoned, which is a continuation of Ser. No. 901,955, Aug. 29, 1986, abandoned. This application Feb. 5, 1990, Ser. No. 480,363

Claims priority, application Japan, Aug. 30, 1985, 60-191728

Int. Cl.[5] G11B *5/584, 15/467*

U.S. Cl. 360—77.14 **4 Claims**



1. A method for recording at least first and second PCM digital audio signals at respective first and second equal length areas on a plurality of succeeding slant tracks on a recording medium scanned by a rotary head, and wherein for a given track a same pilot signal is mixed in with each of the first and second information signals at the first and second areas on the given track, comprising the steps of: providing a pilot signal generator for generating at least first, second, third, and fourth pilot signals each having a different frequency;

recording in the first area of each of the plurality of succeeding slant tracks the first PCM digital audio signal such that for each group of four succeeding slant tracks a successively different one of said first through fourth pilot signals is mixed in with the first PCM digital audio signal;

playing back one of the slant tracks so as to reproduce the first PCM digital audio signal at the first area thereof, and using crosstalk pilot signals received from adjacent tracks when scanning the one track to generate a tracking error signal which is used for tracking during playback of the first area of said one track being played back, and sampling and holding said tracking error signal; and

subsequently recording said second PCM digital audio signal at said second area of the same one track having a length equal to that of the first area and also mixing in and recording with the second PCM digital audio signal the same pilot signal present in said first area of the same one track, and controlling a tracking during said recording of said second area on the one track by using said sampled and held tracking error signal derived during playback of said first area so that the first and second equal length areas are aligned with one another along said one track.

4,984,105

CASSETTE LOADING DEVICE FOR FRONT LOADING VCR WHICH UTILIZES THE DRIVING FORCE OF A CAPSTAN MOTOR

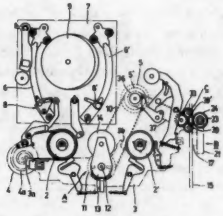
Hak S. Hwang, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 9, 1988, Ser. No. 268,847

Claims priority, application Rep. of Korea, Nov. 10, 1987, 19449/1987

Int. Cl.[5] G11B *5/027*

U.S. Cl. 360—85 **1 Claim**



1. A cassette loading device for a VCR, which comprises:

a capstan motor for driving a supply reel and a take-up reel;

a speed change drive unit for selectively rotating the supply reel or the take-up reel;

a cassette loading unit for loading or ejecting a cassette;

a function plate interlocked with a cam gear; and

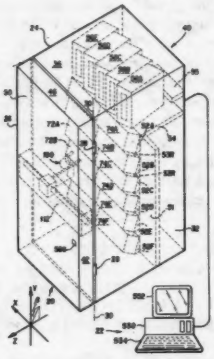
a driving force conversion unit comprising an operational plate which is rotatably mounted on a fixing shaft disposed between the capstan motor and a worm screw of the cassette loading unit and the operational plate is provided with a circular opening and an extended straight opening st one end of the operational plate and diagonal extensions at the other end thereof, an intermediate gear rotatably mounted at the lower portion of the fixing shaft and integrally formed with a pulley which is interconnected with a belt to a pulley fixed to the capstan motor, idler gears which are rotatably mounted through intermediary of compression coil springs, first flat washers and second flat washers, respectively on axial pins fixed below to the extensions of the operational plate and are adapted to selectively mesh with a loading gear formed with said worm screw of the cassette loading unit, and a stopper pin which is inserted into either the circular opening or the extended straight opening of the operational plate, selectively.

4,984,106

CARTRIDGE LIBRARY SYSTEM AND METHOD OF OPERATION THEREOF

Zoltan L. Herger, and Vladimir Nejezchleb, both of Boulder, Colo., assignors to Exabyte Corporation, Boulder, Colo.

Filed Nov. 10, 1988, Ser. No. 269,388
Int. Cl.[5] G11B *15/68, 17/22;* B65G *1/00, 65/00*
U.S. Cl. 360—92 **17 Claims**



1. An automated library for handling units of information storage medium comprising:

a plurality of cells for accommodating units of information storage medium;

a cabinet wherein said plurality of cells are located, said cabinet having an open end toward which said cells face;

means for engaging a unit in a first of said cells;

means for displacing said engagement means along at least two orthogonal axes whereby said engaged unit is transported to a second of said cells, and,

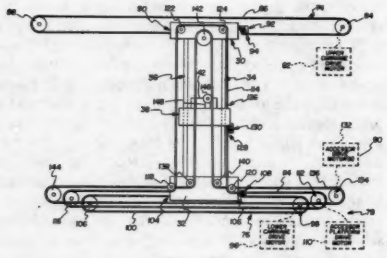
a door for selectively closing said open end of said cabinet, said door having said engagement means and said displacing means mounted thereon.

4,984,107

APPARATUS FOR TRANSPORTING A MAGNETIC TAPE CASSETTE

Ionel Mondocea, Glendale; John P. Grant, Downey, and Frederic F. Grant, Bellflower, all of Calif., assignors to Datatape Incorporated, Pasadena, Calif.

Filed Dec. 16, 1988, Ser. No. 285,833
Int. Cl.[5] G11B *15/68*
U.S. Cl. 360—92 **3 Claims**



1. Apparatus for transporting a magnetic tape cassette comprising:

spaced, parallel, upper and lower horizontal rails;

an upper carriage mounted for horizontal movement on said upper rail and a lower carriage mounted for horizontal movement on said lower rail;

a vertical rail structure mounted on and extending between said upper and lower carriages;

a platform mounted for vertical movement on said vertical rail structure;

a magnetic tape cassette gripper assembly mounted on said platform for movement in a direction substantially orthogonal to said horizontal and vertical directions;

a first drive belt means coupled to one of said upper and lower carriages and first stationary motor means for driving said first drive belt means to cause said one carriage to effect said horizontal movement along the rail on which it is mounted;

a second drive belt means coupled to said platform and second stationary motor means for driving said second drive belt means to cause said platform to effect said vertical movement along said vertical rail structure;

a third drive belt means coupled to said magnetic tape cassette gripper assembly and a third stationary motor means for driving said third drive belt means to cause said gripper assembly to effect movement in said orthogonal direction; and

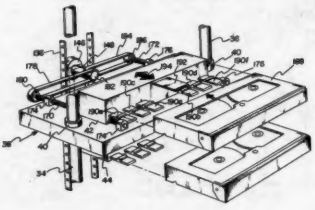
wherein selective actuation of said first, second and third stationary motor means effects movement of said gripper assembly in said horizontal, vertical and orthogonal directions.

4,984,108

APPARATUS FOR TRANSPORTING MAGNETIC TAPE CASSETTES OF DIFFERENT SIZES

Frederic F. Grant, Bellflower, and John P. Grant, Downey, both of Calif., assignors to Datatape Incorporated, Pasadena, Calif.

Filed Dec. 16, 1988, Ser. No. 286,403
Int. Cl.[5] G11B *15/68, 5/008*
U.S. Cl. 360—92 **4 Claims**



1. Apparatus for transporting a magnetic tape cassette, comprising:

upper and lower finger means for gripping a cassette, said upper finger means being mounted relative to said lower finger means for rotation between open and closed positions;

means for supporting said upper and lower finger means for reciprocal movement relative to a stationary cassette, wherein said upper and lower finger means and said supporting means are movable relative to each other;

means for moving said supporting means between a position spaced from a stationary cassette at which said upper finger means is in said open position and each of said upper and lower finger means being spaced from said cassette and a position at which said lower finger means engage said cassette and said upper finger means is rotated to said closed position to grip said cassette;

locking means, actuated by movement of said supporting means, for locking said upper finger means in said closed

position to prevent release of said cassette by said upper and lower finger means; and

wherein said lower finger means includes a first set of lower fingers for gripping a cassette of a first width and a second set of lower fingers for gripping a cassette of a second width greater than said first cassette width, said second set of fingers being located outwardly of above said first set of fingers with respect to said upper finger means.

4,984,109

REEL SUPPORT POSITIONING DEVICE FOR A CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS ACCOMMODATING CASSETTES OF DIFFERENT SIZES

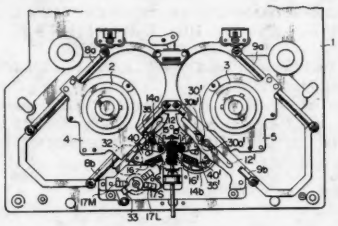
Shouzou Yokoo, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 365,123

Claims priority, application Japan, Jun. 15, 1988, 63-145702; Dec. 23, 1988, 63-323288; Mar. 10, 1989, 1-56407; Apr. 12, 1989, 1-90701

Int. Cl.[5] G11B *15/00*

U.S. Cl. 360—94 **32 Claims**



1. A positioning device for positioning reel supports adapted to accommodate a pair of spaced reels having a tape-like recording medium wound thereon, the positioning device comprising:

shifting means for shifting said reel supports to a predetermined position and holding said reel supports in said predetermined position in dependence upon at least one of a diameter of said reels and a distance between said pair of reels;

a plurality of guide members fixedly provided on a stationary support of the positioning device and engageable by said shifting means for supporting said shifting means in a predetermined posture with respect to the stationary support and for guiding a movement of said shifting means with respect to the stationary support;

first guide means provided on said stationary support and including guide surfaces extending in parallel with a longitudinal axis of said guide member;

second guide means provided on said shifting means and including first guide surfaces each extending in a direction oriented at predetermined angles with respect to the longitudinal axis of the guide members and second guide surfaces overlapping guide portions of said first guiding means;

a plurality of operation member each having one end engaged by said first guide means and said second guide means for enabling each of said operation members to shift said shifting means along the respective guide members by moving and guiding said one end along said first guide means and said second guide means;

a plurality of rotary members adapted to be selectively rotated in a forward and a reverse direction for imparting turning movements to free ends of said operation members opposite the respective ends engaged by said first guide means and said second guide means;

pivot shaft means for respectively rotatably supporting said operation members on said rotary members;

supporting means for supporting said pivot shaft means at the respective rotary members, said supporting means being disposed in a plane perpendicular to a central axis of rotation of the respective rotary members and extending in a rotational direction of the respective rotary members to pass through a center of rotation of the respective rotary members, each of said supporting means including the first end connected through the respective pivot shaft means to the respective free ends of the respective operation members, said supporting means being adapted to rotate together with said rotary members upon the rotation thereof;

a plurality of elastic means respectively provided between the respective rotary members and associated supporting means, each of said elastic means having a first end connected to the respective rotary members and a second end connected to a free end of the associated supporting means, said elastic means being adapted to constantly apply elastic forces to said supporting means in radial directions of the respective rotary member; and

a motor means connected to said rotary members for rotatably driving said rotary members.

4,984,110

TAPE CARTRIDGE HOLDER ARRANGEMENT IN A MAGNETIC RECORDING AND REPRODUCING DEVICE

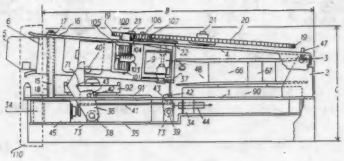
Yoshihisa Inoue, Hannou, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed Jan. 26, 1989, Ser. No. 303,265

Claims priority, application Japan, Jan. 27, 1988, 63-16587

Int. Cl.[5] G11B *15/67*

U.S. Cl. 360—95 **6 Claims**



1. A magnetic recording and reproducing apparatus comprising:

holder means to contain a tape cartridge including a single tape reel so as to move said tape cartridge between a cartridge loading and unloading position and a cartridge operative position;

and leader block guide and drive means including at least an electric motor and a drawing pin member driven by said electric motor;

said leader block guide and drive means being provided in said holder means to guide and drive a leader block provided at a leading end of a magnetic tape on said single tape reel along a predetermined path so as to mount said leader block on a winding reel provided by said apparatus.

4,984,111

MAGNETIC TAPE RECORDER WITH CAPSTAN CASSETTE TRANSPORT

Guttorm Rudi, Fjellhamar, Norway, assignor to Tandberg Data AS, Oslo, Norway

Filed Nov. 2, 1988, Ser. No. 266,404

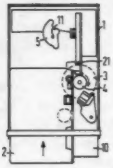
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 3737286

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.5 **10 Claims**

1. A magnetic tape recorder means adapted to receive a generally rectangular cassette lengthwise in a longitudinal direction, said cassette containing a magnetic tape and a con-

veyor roller rotatably mounted adjacent to a recess of a longitudinal sidewall of said cassette and designed for moving said magnetic tape within said cassette, said tape recorder means comprising a locking mechanism for moving said cassette, as it is being inserted into the tape recorder means, from an intermediate rest position into a defined operating rest position and securing the same therein, said tape recorder means further comprising a capstan driven by a motor and engaging said conveyor roller upon locking of said cassette in said operating



rest position, said motor, in addition, being operative to perform at least one of two steps of automatically moving said cassette into said intermediate rest position, upon employment of said capstan, following a partial manual insertion of said cassette into said tape recorder means, and ejecting said cassette a prescribed distance out of said intermediate rest position, upon employment of said capstan, following a partial ejection of said cassette out of said operating rest position into said intermediate rest position, upon manual release of said locking mechanism.

4,984,112

RECORDING AND/OR REPRODUCING APPARATUS FOR A RECORD CARRIER IN TAPE FORM

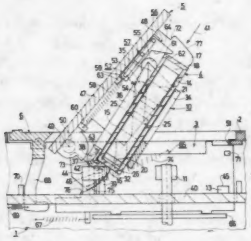
Franz Kletzl, Kilb, and Winfried Schafler, Korneuburg, both of Austria, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1988, Ser. No. 253,275

Claims priority, application Austria, Dec. 23, 1987, 3417/87

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.6 **16 Claims**



1. A recording and/or reproducing apparatus for a tape cassette having two major walls, two pair of opposing side walls, and a pair of reel hubs rotatably disposed between said major walls, said apparatus having

a pair of winding spindles for receiving the reel hubs of a tape cassette,

a cassette holder for holding a tape cassette, said holder being pivotable about a holder pivot axis between a load position in which a tape cassette is insertable in said holder and an operating position in which the reel hubs of a tape cassette loaded in said holder are engaged by said winding spindles, said holder having a limit stop arranged for engaging a first side wall of the cassette for limiting the insertion of a cassette loaded in said holder; and

a pressure mechanism for engaging said cassette during the pivoting of said cassette holder from said load position to said operating position to urge said cassette against said limit stop, said pressure mechanism being positioned out of engagement with a cassette in the load position of said holder, the improvement comprising:

a pivotable carrier pivotable about a carrier pivot axis between an initial position and a working position, said carrier pivot axis being parallel to and offset from said holder pivot axis,

means for coupling said carrier to said cassette holder such that said carrier and cassette holder pivot in unison over at least a partial range between said load and operating positions of said holder; and

said pressure mechanism being arranged on said carrier and said carrier pivot axis being offset from said holder pivot axis such that said pressure mechanism moves towards and engages a cassette inserted in said holder as said cassette holder is pivoted from said load position to said operating position to urge the cassette against said limit stop.

4,984,113

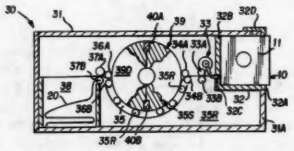
INFORMATION STORAGE AND REPRODUCTION APPARATUS AND METHOD EMPLOYING A FLEXIBLE BELT RECORD MEMBER

Jerome H. Lemelson, 868 Tyner Way, Call Box 14-286, Incline Village, Nev. 89450

Continuation of Ser. No. 38,706, Apr. 15, 1987, abandoned. This application Dec. 20, 1989, Ser. No. 456,219

Int. Cl.[5] G11B *15/18, 23/04, 21/02;* H04N *5/78*

U.S. Cl. 360—101 **18 Claims**



1. An apparatus for transducing information, said apparatus comprising:

(a) a magazine having an elongated housing defining an enclosed container,

(b) an elongated flexible record belt having a width shorter than the length of said housing and containing a plurality of parallel record tracks along most of its length,

(c) an elongated spool having a length less than the length of said housing and shaped to contain said belt wound in a coil formation thereon and unwindable therefrom,

(d) means for rotationally supporting said spool for rotation about its longitudinal axis within said housing,

(e) one end of said belt being secured to said spool,

(f) an elongated narrow opening in said housing extending parallel to the rotation axis of said spool and greater in length than the width of said belt, said opening configured to permit said belt to longitudinally travel through said opening in unwinding from said coil and in rewinding on said coil,

(g) means for supporting and normally retaining the free end of said belt aligned with said opening in said housing when said belt is fully wound in said spool for storage in said housing,

(h) transducing means including a support for said magazine and a transducer movably supported on said support at a transducing location,

(i) means for engaging and driving said free end of said belt through said opening when said magazine is operatively supported by said support, and guiding said belt along a

fixed path to said transducing location to position a select length of said belt at said transducing location,

(j) means for effecting controlled driving movement of said transducer and energizing said transducer as it moves to cause it to scan and transduce with respect to a select of said parallel record tracks extending along the portion of said belt at said transducing location.

4,984,114
FLYING HEAD SLIDER

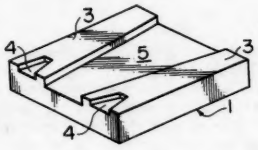
Yoshinori Takeuchi, Ibaraki; Yuzo Yamaguchi, Tsuchiura; Katsuyuki Tanaka; Fumitaka Muranushi, both of Ibaraki, and Hiroshi Daito, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 367,662

Claims priority, application Japan, Jun. 20, 1988, 63-152039

Int. Cl.[5] G11B *5/60*

U.S. Cl. 360—103 **22 Claims**



1. A flying head slider comprising a slider body disposed in opposed relationship to a recording medium and including a surface faced to said recording medium, a plurality of positive pressure generating rails being formed on said surface of said slider body to float said slider body by positive pressure generated due to a fluid flow caused by movement of said recording medium relative to said slider body, and a bleed section formed in said surface of said slider body between said plurality of positive pressure generating rails, said bleed section having a fluid-inlet end and a fluid-outlet end and having a cross-sectional area taken transversely of a flow of fluid through said bleed section, said cross-sectional area being smaller in said fluid-inlet end than in said fluid-outlet end, and stepped bearing means formed in each of said positive pressure generating rails adjacent to a fluid inlet end thereof for generating a floating force, each of said stepped bearing means comprising a recess in the fluid inlet end of an associated positive pressure generating rail.

4,984,115
ROTARY ACTUATOR AND BEARING SUPPORT THEREFOR

Tsuyoshi Takahashi; Katsumi Kawamura; Jun Naruse, and Jyousei Shimizu, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 943,750, Dec. 19, 1986, Pat. No. 4,892,423. This application Jul. 3, 1989, Ser. No. 374,832

Claims priority, application Japan, Dec. 23, 1985, 60-287703

Int. Cl.[5] G11B *5/55*

U.S. Cl. 360—106 **8 Claims**

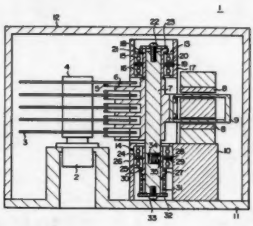
1. A rotary actuator comprising:

a rotational shaft;

a plurality of bearing sets arranged in spaced relationship along a longitudinal axis of said rotational shaft to support opposite ends of said rational shaft, each of said plurality of bearing sets including an outer ring and an inner ring which are concentric with respect to said rotational shaft, and a plurality of ball bearings interposed between said outer and inner rings;

an elastic member interposed between the respective inner rings of said plurality of bearing sets and having applied thereto a force in an axial direction of said rotational shaft, said elastic member being a substantially circular sinuous washer having a plane in which a plurality of alternate peaks and valleys perpendicularly intersect; and

wherein said plurality of balls bearings are situated interiorly



of a housing of said bearing set in the axial direction of said rotational shaft such that, under the application of an axial force, the ball bearings share substantially equally component forces generated by said elastic member.

4,984,116
MAGNETIC SCANNING DEVICE FOR AN OBLIQUE-TRACK TAPE DECK

Manfred Hescher, Weiterstadt, and Theo Wolf, Rossdorf, both of Fed. Rep. of Germany, assignors to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

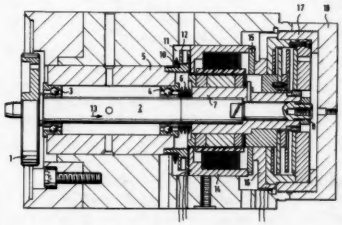
PCT No. PCT/DE88/00052, § 371 Date Oct. 13, 1988, § 102(e) Date Oct. 13, 1988, PCT Pub. No. WO88/06782, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 3, 1988, Ser. No. 272,888

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3705929

Int. Cl.[5] G11B *5/56, 5/53*

U.S. Cl. 360—109 **6 Claims**



1. Playback device for an oblique-track magnetic tape desk having a rotor portion (1, 2) and a stator portion (14), including

a rotatable head wheel axle (2) defining an axis of rotation;

a bearing unit (5) supporting said head wheel axle (2) by applying thereto predetermined radial pressure vectors tending to maintain a constant orientation of said axis of rotation;

a head wheel support plate (1) mounted on said axle (2) for rotation therewith; and

a means for axial adjustment, along said axis of rotation, of said head wheel axle (2) in said tape deck,

wherein, in order to adjust a height, defined along said axis of rotation, at which said head wheel support plate (1) rotates, while maintaining said predetermined radial pressure vectors substantially constant,

said axle (2) is supported in the bearing unit (5) under biassing or pre-tensioning by a plurality of rolling contact bearings (3,4) and

means (10, 12, 15, 16) are provided for axially adjusting, along said axis of rotation, height of the bearing unit (5)

with respect to said tape deck stator portion (14) by a corresponding amount, thereby maintaining axial alignment of said axle and said bearing unit and essentially constant radial pressure vectors therebetween.

4,984,117

DEVICE WITH READ HEAD FOR MAGNETICALLY RECORDED INFORMATION

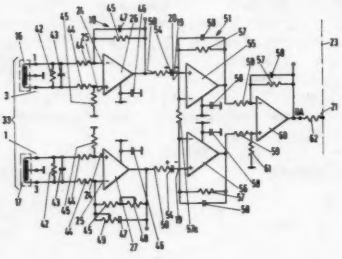
Günter Nölke, Villingen-Schwenningen; Gunter Ketterer, Unterkirnach, and Horst Dyma, VS-Pfaffenweiler, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,844

Claims priority, application European Pat. Off., Dec. 1, 1987, 87730159.8

Int. Cl.[5] G11B *5/17*

U.S. Cl. 360—124 **20 Claims**



1. A device with a read head for reading magnetically recorded information in connection with electronic data processing equipment, comprising

a frame;

a read head;

a reference head, where the read head and the reference head are combined to a reading system such that the read head and the reference head are associated in each case with equal mechanical and electrical values;

a difference circuit having an output where the read head and the reference head are each connected to the difference circuit and where the difference signal of the read head and of the reference head is formed from a combination signal derived of an electromagnetic interference field and an electromagnetic read field and, respectively, of an electromagnetic interference field and where the difference signal is furnished at the output of the difference circuit of a read electronic;

parallel connected amplifiers, which are connected as differential amplifiers, having an input for a interference voltage from the reference head, having an input for a mixing voltage from the read head, and having an output, where the interference voltage (UE2) at the reference head and the mixing voltage (UE1) at the read head are respectively applied at inputs of said parallel-connected amplifiers;

a read electronic connected to the output of the parallel connected amplifiers where an output signal (UA) from the output is applied at the read electronic.

4,984,118

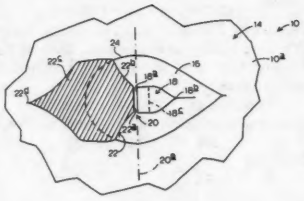
FLUX-CONCENTRATING, NON-GHOSTING ELECTROMAGNETIC READ/WRITE HEAD

Gilbert D. Springer, Fremont, Calif., assignor to Springer Technologies, Fremont, Calif.

Filed Jan. 9, 1989, Ser. No. 294,351

Int. Cl.[5] G11B *5/187, 5/23, 5/127*

U.S. Cl. 360—125 **3 Claims**



1. An electromagnetic read/write head structure for longitudinal/horizontal reading and writing comprising

first and second magnetic pole components spaced by a substantially uniform-width, linear, elongate, planar gap, said pole components each being characterized by a configuration, measured generally in the plane of said gap, where no portions of the outlines of the pole components, save those portions which define said gap, include any portion extending parallel to the gap,

one of said first and second components having a cross-sectional configuration, as viewed in plane substantially normal both to the plane of and to the long axis of said gap, which, progressing away from the gap, is defined by a stepped construction that increases in thickness, and the other of said components, as similarly viewed, is underbeveled relative to the plane of the gap.

4,984,119

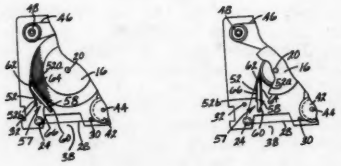
CLEANING APPARATUS FOR MAGNETIC DATA TAPE CARTRIDGES

Richard A. Backlund, and Sten R. Gerfast, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 30, 1990, Ser. No. 472,028

Int. Cl.[5] G11B *5/41*

U.S. Cl. 360—128 **13 Claims**



1. A cleaning device for removing debris from tape contained in a reel to reel magnetic data tape cartridge and extending along a tape path extending from one reel to the other and around a pair of tape guides wherein the tape guides are located adjacent one edge wall of the tape cartridge and each tape guide is associated with a respective tape reel, the cleaning device comprising:

cleaning material located between one tape guide and its associated tape reel along the tape path such that tape tension always biases the magnetic side of the tape against the cleaning material regardless of the amount of tape wound on the associated tape reel to remove debris from the tape as the tape passes and contacts a portion of the

cleaning material, and wherein the tape contacts different portions of the cleaning material depending on the amount of tape wound on the tape reel; and

means for mounting the cleaning material in the tape cartridge.

4,984,120

CLEANING CASSETTE FOR A VIDEO CASSETTE TAPE DECK

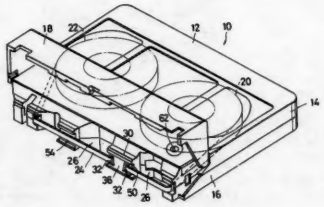
Takateru Satoh; Kenji Hashizume; Morimasa Sasaki, and Kimio Tanaka, all of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Jan. 25, 1989, Ser. No. 302,018

Claims priority, application Japan, Jan. 27, 1988, 63-8101[U]; Jan. 27, 1988, 63-8103[U]

Int. Cl.[5] G11B *5/41*

U.S. Cl. 360—128 **9 Claims**



1.

A cleaning cassette comprising:

a feed reel and a take-up reel on which a cleaning tape is wound in a manner to be stretched therebetween;

a casing in which said feed reel and take-up reel are rotatably received, said casing being provided at a front portion thereof with insertion recesses for permitting access of tape loading members of a tape operating device to said cleaning tape; and

a tape passing mechanism arranged between said insertion recesses for effecting safe and stable running of said cleaning tape;

said tape passing mechanism comprising a pair of rollers through which said cleaning tape is passed and a support member for supporting said rollers thereon such that said rollers can rotate;

said rollers being each supported at each of its respective ends in a manner to be laterally spaced from each other adjacent a front surface of said casing and reciprocatively movable in a longitudinal direction of said casing and wherein said rollers are vertically obliquely arranged in the form of a bottom-opened V-shape.

4,984,121

MAGNETIC RECORDING/REPRODUCTION APPARATUS HAVING NEGATIVE AND POSITIVE PRESSURE GENERATING MEMBERS FOR DEFORMING A FLEXIBLE MAGNETIC DISK

Yasuo Nagashima, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

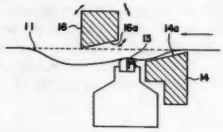
Filed Jan. 27, 1989, Ser. No. 302,296

Claims priority, application Japan, Feb. 8, 1988, 63-25726

Int. Cl.[5] G11B *15/60*

U.S. Cl. 360—130.34 **3 Claims**

1. A magnetic recording/reproduction apparatus using a magnetic head in sliding contact with a flexible magnetic disk for recording and reproduction, said disk being rotatable about an axis and having a periphery, comprising: a negative pressure generating member disposed at the upstream side of said magnetic head and at the same side of said magnetic head with respect to said flexible magnetic disk, and a positive pressure generating member at the downstream side of said magnetic head and at the opposite side of said magnetic head with respect to said flexible magnetic disk, said negative pressure generating member having an inclined surface inclined to be



farther from said flexible magnetic disk towards the downstream side, and said positive pressure generating member having an inclined surface to be closer to said flexible magnetic disk towards the downstream side.

4,984,122

TAPE CASSETTE WITH AIR BLOCKING BAFFLES

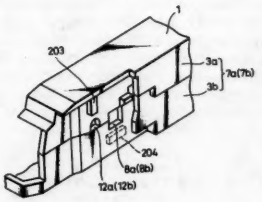
Shinya Sato, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,380

Claims priority, application Japan, Nov. 11, 1987, 62-284475

Int. Cl.[5] G11B *23/04*

U.S. Cl. 360—132 **6 Claims**



1. A tape cassette having a projector insertion recess provided in the bottom of the cassette adjacent the cassette front between supply and take-up reels enclosed within the cassette, light receiving window apertures provided in both side walls of the cassette to allow the light from a light emitting element inserted in the projector insertion recess to be passed laterally therethrough, and a lid pivotally mounted on the front side of the cassette via arms pivoted on the side walls, so that in a stored condition, the light receiving window apertures are closed by the arms of the lid, characterized in that baffles, each of which is in the shaped of a long projection and is disposed in a respective different direction between the side wall of the cassette and the arm of the lid, are provided adjacent the light receiving window apertures provided in both the side walls of the cassette to impede air flow in different directions from outside the cassette into the cassette via the apertures, thus preventing dust from entering the cassette.

4,984,123

LATCHING SWITCHING DEVICE HAVING CURRENT RESPONSIVE RELEASE

Gene L. James, Princeton, Ind., assignor to Potter & Brumfield, Inc., Princeton, Ind.

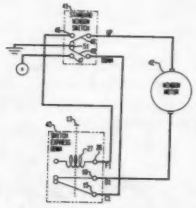
Filed Jul. 17, 1989, Ser. No. 380,955

Int. Cl.[5] H02H *5/04*; H01H *71/16*

U.S. Cl. 361—26 **8 Claims**

1. A switch device for controlling an electric current in a circuit, the switch device comprising:

(a) a movable contact arm and a stationary contact;
(b) an actuator operatively connected to effect movement of the movable contact arm;
(c) latching means for engaging a first end of the movable contact arm during movement to hold a latched position against a return force counteracting the movement while completing a continuity path between a second end of the movable contact arm and the stationary contact; and
(d) bi-metallic means for unlatching the latching means responsive to the electric current exceeding a predetermined value, the bi-metallic means serially connected in the continuity path and being displaced by heat generated



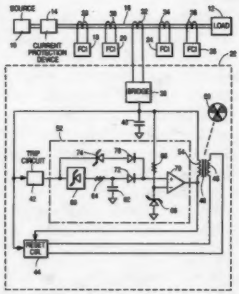
by the current to move the latching means and free the movable contact arm for return movement by the return force and disrupting the continuity path;
wherein the actuator comprises an external button and at least one elongated member extending into the device having an interior end, the elongated member having a slide wherein the movable contact arm travels; and
wherein the elongated member has an elongated guide member located therein and extending along the slide, and a spring mounted on the guide member and providing a compressional force on the movable contact arm in a direction opposite to the movement of the actuator.

4,984,124

FAULTED CURRENT INDICATOR WITH INRUSH RESTRAINT

Thomas Yeh, South Weymouth, Mass., assignor to Sigma Instruments, Inc., Weymouth, Mass.

Filed Jun. 30, 1989, Ser. No. 374,215
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—59 **14 Claims**



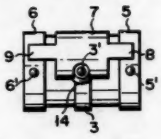
1. A faulted current indicator for a cable which includes a circuit breaking device that opens in response to a first overcurrent occurring for a first overcurrent duration, comprising:
sensing means for responding to current in the cable;
reset means responsive to said sensing means for producing reset signals; and
trip means coupled to said sensing means for producing a trip signal in response to a second overcurrent occurring for a second overcurrent duration, said second overcurrent duration being inversely related to the magnitude of the second overcurrent and shorter than the first overcurrent duration.

4,984,125

ARRESTER APPARATUS

Yukio Uwano, Sagamihara, Japan, assignor to Sankosha Corporation, Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 391,293
Claims priority, application Japan, Aug. 10, 1988, 63-104861[U]
Int. Cl.[5] H02H *1/04*
U.S. Cl. 361—124 **3 Claims**



1. An arrester, comprising:
an insulating tubular member;
a pair of main electrodes air-tightly coupled to respective open ends of said insulating tubular member;
a ground electrode attached to a central portion of said insulating tubular member; and
a springy, electrically-conductive short-circuiting element having a substantially cylindrical shape essentially conforming to the shape of said insulating tubular member, said short-circuiting element being fitted around an outer wall of said ground electrode by utilization of spring characteristics of said short-circuiting element to allow electrical connection between said short-circuiting element and said ground electrode, said short-circuiting element including extension portions extending along an outer wall of said insulating tubular member to respective main electrodes, said extension portions facing said main electrodes with a certain gap maintained when a thermally-fusible spacer is unfused;
wherein if said arrester is overheated, said spacer is thermally fused by heat and said extension portions electrically contact said main electrodes due to spring characteristics, short-circuiting said main electrodes to said ground electrode;
and wherein said spacer has a central hole and is sandwiched between said short-circuiting element and said ground electrode, with a terminal of said ground electrode fitted in said central hole, and said extension portions of said short-circuiting element are made to face said main electrodes by utilization of spring characteristics, with said certain gap maintained.

4,984,126

METHOD AND CIRCUIT FOR STOPPING THE TEST RUN OF A ROTOR BEING BALANCED

Karl Rothamel, Darmstadt, Fed. Rep. of Germany, assignor to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Sep. 8, 1988, Ser. No. 241,847
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730084
Int. Cl.[5] H01H *47/32*
U.S. Cl. 361—144 **5 Claims**

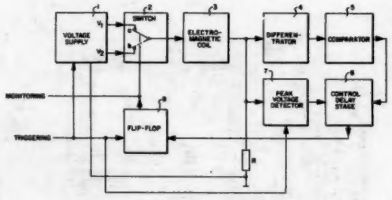
1. An apparatus for moving a movable member, biased by a biasing force in a first position, to a second position comprising:
an electromagnetic coil for producing a force on said mov-

able member in opposition to said biasing force, in response to the application of an electric voltage on said electromagnet coil;

voltage supplying means for applying a first electric voltage to cause a time-increasing current flow in said electromagnet coil so that said movable member is moved against said biasing force to said second position and for applying a second electric voltage to said electromagnetic coil, less than said first electric voltage, to maintain said movable member in said second position;

control means for causing said voltage supplying means supply said first voltage when said movable member is in said first position and said second voltage when said movable member is in said second position;

switch means for connecting said electromagnetic coil to one of said supplying means first electric voltage and said supplying means second electric voltage;



a flip-flop electrically connected to said switch means, said flip-flop transmitting an electric signal to said switch means thereby causing said switch means to connect said electromagnetic coil to one of said supply means first electric voltage and said supply means second electric voltage;

a differentiation circuit electrically connected to said electromagnetic coil for detecting an interruption in the increase in the time-increasing current and generating a signal in response thereto; and

a comparator electrically connected between said differentiation circuit and said flip-flop for causing said flip-flop to change from a state wherein said switch means connects said electromagnetic coil to said supplying means first electric voltage to a state wherein said switch means connects said electromagnetic coil to said supplying means second electric voltage in response to said signal generated by said differentiation circuit.

4,984,127

CONTROL SYSTEM FOR PRECISION SPINAL ADJUSTMENT

Joseph M. Evans, Export; E. Rex Moore, and James B. Sullivan, both of Pittsburgh, all of Pa., assignors to Kinetic Technology, Inc., Greensburg, Pa.

Filed Apr. 4, 1989, Ser. No. 333,019
Int. Cl.[5] A61F *5/00*
U.S. Cl. 361—179 **13 Claims**

1. A system for controlling a chiropractic adjustment instrument including an adjustor head for placement against the body of a patient, said system comprising:

a capacitor means;

a solenoid means connected to said capacitor means and said adjustor head for driving said adjustor head against the body of said patient;

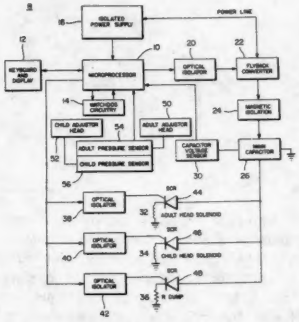
a microprocessor means;

pressure sensing means connected to said microprocessor means for detecting the pressure between said adjustor head and the body of said patient and producing an output signal representative thereof and conveying said output signal to said microprocessor;

a capacitor charging means connected between said microprocessor means and said capacitor means for charging said capacitor means;

a capacitor discharge means for discharging said capacitor into said solenoid means;

a capacitor voltage sensing means connected to said microprocessor means for detecting voltage across said capacitor means and delivering an output signal representative thereof to said microprocessor means; and



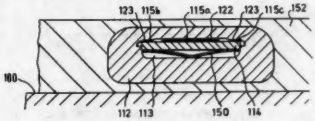
wherein said microprocessor means triggers said capacitor charging means to charge said capacitor means to a predetermined voltage level monitored by said capacitor voltage sensing means, and whereby said microprocessor triggers said capacitor discharge means to discharge said capacitor means to said solenoid means when said pressure sensing means detects a predetermined pressure level of said adjustor head against the body of said patient.

4,984,128

CAPACITATIVE WEIGHT SENSOR

David Cebon, Queen's College, Cambridge CB3 9ET; David J. Cole, 36 Lawn Road, Chelmsford, Essex CM1; Michael S. A. Hardy, Gonville & Caius College, Cambridge CB2 1TA, and David E. Newland, Ickleton Lodge, Ickleton, Saffron Walden, Essex CB10 1SH, all of England

Filed Mar. 30, 1989, Ser. No. 330,427
Int. Cl.[5] H01G *7/00*; G01G *3/14*
U.S. Cl. 361—283 **20 Claims**

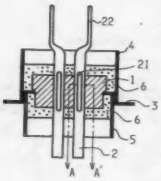


2. A strip capacitor comprising elongated first and second spaced electrodes having a length substantially greater than their widths, said elongated second electrode being formed as a first portion of a conducting film disposed on an insulating member, said conducting film including a pair of parallel second portions non-contiguous with said first portion and wherein said parallel second portions are arranged to abut longitudinal supports projecting from opposite sides of said first electrode which define the spacing between said elongated first and second electrodes.

4,984,129
THROUGH-TYPE CAPACITOR

Mamoru Tsuzurahara, and Ichiro Ohara, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1990, Ser. No. 495,763
Claims priority, application Japan, Mar. 20, 1989, 1-66143
Int. Cl.[5] H01G *3/28*
U.S. Cl. 361—302 3 Claims

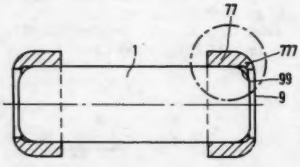


1. A through-type capacitor providing a through hole in almost cylindrical dielectric material in parallel to the axis of said cylindrical material and forming electrodes by respectively metallizing the internal circumferential side wall surface of said through hole and external circumferential side wall surface of said dielectric material, comprising the structure that a hollow metal pipe is used as a through terminal inserted into a through hole, a plurality of slits are provided with an equal interval in the circumferential direction in the metal wall surface of said pipe inserted into the through hole and the metal wall surface of said pipe on the part of adjacent slits are respectively soldered to the electrode of internal circumferential side wall surface of said through hole for the connection.

4,984,130
PASSIVE ELECTRIC COMPONENT

Helmut L. Düll, Heide, and Horst W. Flunkert, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 928,148, Nov. 7, 1986, abandoned. This application Apr. 12, 1990, Ser. No. 512,631
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 3619212
Int. Cl.[5] H01G *1/147;* H01C *1/142;* H05K *1/16*
U.S. Cl. 364—321 14 Claims



1. A passive electric component suitable for surface mounting comprising:

an elongated supporting member carrying a layer of electrical component material and having a pair of conductive termination areas for said layer at the circumferential perimeter of said supporting member proximate respective opposite end faces of said supporting member; and

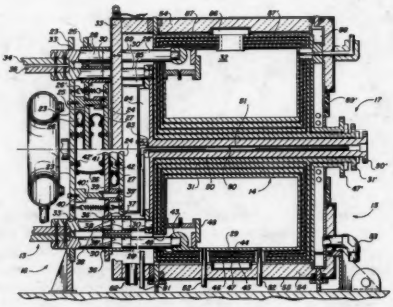
surface mounting means comprising a pair of electrical connection elements at opposite ends of said supporting member respectively surrounding the circumferential perimeter of said supporting member and being in electrical contact with said pair of conductive termination areas, said electrical connection elements having open outward ends substantially flush with the respective end faces of said supporting member,

whereby said electrical component has an overall length measured between the opposite open outward ends of said electrical connection elements, and the area of the portion of said electrical component which is free of said electrical connection elements is maximized relative to said overall length.

4,984,131
ELECTRICAL DISCONNECT METHOD AND APPARATUS

James M. Weldon, Austin, Tex., assignor to Parker Kinetic Designs, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 728,334, Apr. 29, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 142,842
Int. Cl.[5] H02B *13/00;* H05K *7/20*
U.S. Cl. 361—335 39 Claims



1. A disconnect apparatus by which a cryogenic inductor can be thermally and electrically isolated from a workload and a generator, comprising, in combination:

an input thermal disconnect and an output thermal disconnect; said input disconnect includes a plurality of electrical conducting inner electrodes connected to supply current to an inductor and a plurality of electrical conducting outer electrodes connected to receive power from a generator; said inner and outer electrodes are arranged in pairs, each of the pairs of electrodes include one of said inner electrodes and one of said outer electrodes arranged along a common axis and in spaced relationship respective to each other;

some of said pairs of electrodes are arranged to describe a large diameter circle, and the other of said pairs of electrodes are arranged to describe a small diameter circle respective to said large diameter circle; an electrical conducting sleeve for each said pair of electrodes; means for actuating each said electrical conducting sleeve between a retracted non-conducting position and a closed conducting position respective to the pair of electrodes therefor; each said electrical conducting sleeve, when actuated to the closed position, bridges the intervening space between the inner and outer electrodes of a pair of electrodes and thereby conducts current between the outer and inner electrodes of a pair of electrodes;

whereby: thermal insulation means can be removably received between the spaced electrodes when each electrical conducting sleeve is retracted, and thereby thermally isolate the inner electrodes from the outer electrodes;

said output disconnect includes at least two circumferentially extending output terminals; means connecting the output terminals to receive current from the inductor, said output terminals are axially and radially spaced respective to one another;

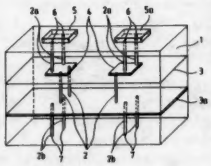
a plurality of finger-like contact means circumferentially arranged about each of the output terminals, said contact means are radially spaced respective to each of said output terminals, means by which said finger-like contact means can be electrically connected to a workload; whereby, when the finger-like contact means are retracted, the inductor is thermally and electrically isolated from workload, and when the finger-like contact means are extended into engagement with the output terminals, the inductor is electrically connected to the workload.

4,984,132

MULTILAYER WIRING SUBSTRATE

Akihiro Sakurai, and Yutaka Watanabe, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1989, Ser. No. 388,961
Claims priority, application Japan, Aug. 10, 1988, 63-198055
Int. Cl.[5] H05K *1/14*
U.S. Cl. 361—414 **9 Claims**



1. An electronic parts mounting apparatus for mounting a plurality of electronic parts of different types, the apparatus comprising:

a multilayer substrate having a first surface;

a plurality of feeding portions attached to the first surface receiving the electronic parts;

a feeding point attached to a second surface of the multilayer substrate, the feeding point allowing external electronic power to be accepted by the mounting apparatus;

a first through-hole wiring on the substrate in contact with the feeding point to transfer the external electronic power from the feeding point;

a common power source layer of the same area as the substrate first surface forming an intermediate layer of the multilayer substrate in contact with the first through-hole wiring;

a plurality of second through-hole wirings in contact with the common power source layer, the second through-hole wirings extending from the common power source layer;

a plurality of third through-hole wirings connected to at least one of the feeding portions; and,

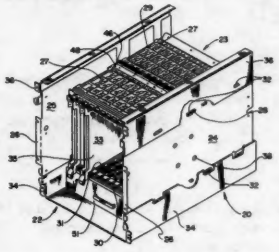
a plurality of conductors located under the electronic parts between the first surface and the common power source layer, the conductors provided in a one to one correspondence with the electronic parts, the conductor having first and second sides, the first side in contact with an end of selected ones of the second through-hole wirings and the second side in contact with an end of at least one of the plurality of third through-hole wirings, wherein the selected number of the second through-hole wirings is determined based on the type of the electronic parts, whereby the number of the second through-hole wirings transferring the external electronic power to a certain type of the electronic parts is different from that of the through-hole wirings transferring the external power to a different type of the electronic parts.

4,984,133

UNITIZED CENTRAL ELECTRONICS COMPLEX CONSTRUCTION

Wayne J. Casanova; Arthur P. Reckinger, Jr.; Michael D. Seyfert, all of Rochester; James R. Thorpe, Stewartville, and Stephen E. Wheeler, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 19, 1990, Ser. No. 467,594
Int. Cl.[5] H02B *1/02*
U.S. Cl. 361—415 **4 Claims**



1. A central electronic complex having two back-to-back logic cages, said complex for containing logic elements and ancillary equipment for computing systems, said complex comprising:

a. two spaced, opposed side plates forming the sidewalls of said complex, said side plates having a plurality of in-line alignment apertures along upper and lower regions thereof,

b. first upper and lower guides having projecting tabs engaged in certain of said apertures of said side plates, said guides being spaced vertically and parallel relative to one another and affixed between said side plates generally perpendicularly thereto to form the upper and lower guide means for receiving logic elements; said first upper and lower guides cooperating with said side plates to form a first logic cage;

c. second upper and lower guides having projecting tabs engaged in further of said apertures of said side plates, said guides being spaced vertically and parallel relative to one another and affixed between said side plates generally perpendicularly thereto to form the upper and lower guide means for receiving logic elements; said second upper and lower guides cooperating with said side plates to form a second logic cage; and

d. a backplane assembly affixed between said first and second logic cages, said backplane assembly having front and rear sides, each side having a plurality of connectors for conductively receiving said logic elements.

4,984,134

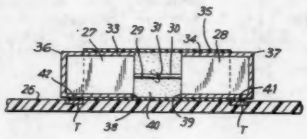
SURFACE MOUNT NON-POLAR TANTALUM CAPACITOR

Gerald M. Locke, Saco, Me., assignor to AVX Corporation, New York, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,452
Int. Cl.[5] H01G *9/00*
U.S. Cl. 361—529 **4 Claims**

1. A surface mounted non-polar tantalum capacitor assembly comprising first and second polar capacitor units, said units each including a body portion having side surfaces and end surfaces, said side surfaces including a conductive coating coupled to the cathodes of said capacitors, each of said capacitor units having a tantalum anode rod projecting from a said end surface and extending parallel to a said side surface, said units being disposed in spaced end to end relation with the rod

of each said unit directed toward and engaging the rod of the other said unit, said rods being weldingly connected, the combination including an insulating sleeve tightly encompassing



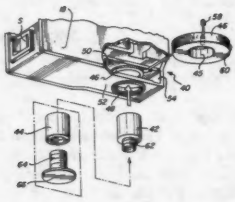
central portions of said body portions and entirely encompassing said rods, increments of said conductive coating of said body portions projecting beyond the opposite ends of said sleeve.

4,984,135

INTERCHANGEABLE CAMERA LIGHT MOUNT

Jeffrey P. Crouch, Terryville, Conn., assignor to Anton/Bauer, Inc., Shelton, Conn.

Filed Mar. 30, 1990, Ser. No. 502,459
Int. Cl.[5] G03B *15/02*
U.S. Cl. 362—8 **11 Claims**



7. Interchangeable mounting means for connecting a portable light or the like to a camera or other support surface provided with a threaded mounting clip having at least one open end defined by a pair of parallel rails spaced from the bottom of the clip, said mounting means comprising:

a housing for said portable light or the like;

a thumbwheel rotatably mounted in said housing and provided with an accessible portion exterior of said housing for enabling contact and rotation thereof;

interchangeable shafts adapted to be removably connected to said thumbwheel within said housing;

means on the perimeter of said thumbwheel for securing each of said shafts to said thumbwheel for rotation therewith;

one of said shafts including a threaded fastener depending from the bottom thereof adapted to be connected to the threaded mounting bore of a camera;

whereupon rotation of said thumbwheel will rotate said shaft and depending threaded fastener so that said housing can be threadedly connected to said camera by inserting said depending threaded fastener on said shaft into the threaded bore in said camera; and

another of said shafts including a threaded fastener threadably mounted thereon and having an enlarged head adapted to be received through the entrance in a U-shaped clip on a camera;

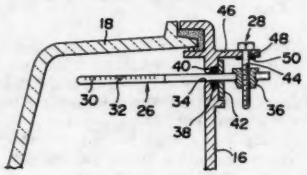
whereupon rotation of said thumbwheel will draw said enlarged head into clamping engagement with the rails of said clip between the bottom of said shaft and said enlarged head of said threaded fastener.

4,984,136

AUTOMOTIVE HEADLAMP UNIT WITH AIMING ADJUSTMENT LID

Hirofumi Yamagishi, Isehara; Shigenobu Ohtsuka; Youichi Kikuchi, both of Yokohama; Takayuki Isobe, Hiratsuka, and Masato Mochizuki, Isehara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Ichikoh Industries, Ltd., Tokyo, both of, Japan

Filed Oct. 20, 1989, Ser. No. 424,741
Claims priority, application Japan, Oct. 20, 1988, 63-136108
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—66 **4 Claims**



1. An automotive headlamp unit for a body of a car, comprising:

a reflector having a front opening, an apex and an optical axis;

a lamp bulb as a light source disposed proximate the optical axis of said reflector;

a lamp housing receiving said reflector and which is to be fixed to the body of a car;

a front lens covering the front opening of said reflector and fixed to said lamp housing; and

adjusters including pivot mechanisms supporting said lamp housing pivotably in relation to the car body and which tilt said lamp housing about a horizontal axis and a vertical axis, respectively;

said lamp housing being provided with an aiming adjustment aid composed of a level vial tiltably supported inside a vertical surface of the lamp housing parallel to the optical axis and a manual operating member which adjusts the tilt angle of the level vial; and

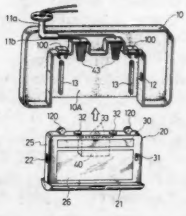
wherein said level vial is disposed within said lamp housing and so arranged that the scale on said level vial can be read from outside said lamp housing.

4,984,137

SUN VISOR FOR AUTOMOTIVE VEHICLE

Kenichiro Maemura, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 2, 1989, Ser. No. 430,323
Claims priority, application Japan, Nov. 8, 1988, 63-281541
Int. Cl.[5] B60Q *3/00*
U.S. Cl. 362—74 **9 Claims**



1. A sun visor for an automotive vehicle comprising:

(a) a sun visor body formed with a mirror accommodating

hollow space having an opening in one side space of said sun visor body;

(b) a vanity mirror unit removably held in the mirror accommodating hollow space when said vanity mirror unit is inserted from the opening, said vanity mirror unit having a mirror mounted therein; and

(c) a locking mechanism for locking and unlocking said vanity mirror unit to and from the mirror accommodating hollow space, said locking mechanism comprising:

(1) a cover member formed with a hole;

(2) a slider member having a pivotal hook member inserted into the hole of the cover member and pivotable from a closed position in which it locks said vanity mirror unit within the mirror accommodating hollow space to an open position in which it unlocks said vanity mirror unit from the mirror accommodating space; and

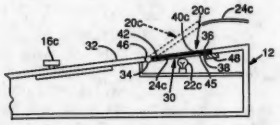
(3) cam means, cooperating with said slider member, for moving said slider member from a first position in which said hook member is held in said closed position via contact with said cover member to a second position in which said hook member is pivotable into said open position.

4,984,138

CONSOLE COLOR DISPLAY

Gary R. Graham, 9375 SW. Parkview Loop, Beaverton, Oreg. 97005

Filed Nov. 16, 1989, Ser. No. 438,608
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—85 **14 Claims**



6. A display for a stage lighting control console, the control console including a plurality of light control devices lying in a given spaced relation, the display comprising:

a mounting structure attachable to the console in position relative to said light control devices;

attaching means for removably attaching to said mounting structure a plurality of selective color filtering elements in spaced relation corresponding to the spaced relation of said light control devices whereby a selected color filtering element may be positioned adjacent a selected light control device; and

a light source for directing light through at least one color filtering element.

4,984,139

POP-UP LANDSCAPE LIGHT

Steven J. Goggia, 625 Parra Grande, Santa Barbara, Calif. 93108

Filed Feb. 20, 1990, Ser. No. 481,190
Int. Cl.[5] F21V *21/22*
U.S. Cl. 362—153.1 **1 Claim**

1. A pop-up landscape light, comprising:

a housing formed from a water-proof material and adapted to be partially buried in the ground;

a light compartment in said housing, said light compartment having a polygonal shape including a plurality of axially extending obliquely angularly intersecting light transmitting facets;

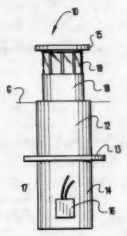
a removable end cap on an upper end of said light compartment, said end cap secured by a plurality of resilient catch members;

an electric light in said light compartment;

a reversible electric rotary stepping motor in said housing;

control means for selectively actuating said stepping motor for a predetermined number of revolutions in opposite rotational directions;

a lead screw connected for rotation by said motor, said lead screw extending within said light compartment and in threaded engagement for extending and retracting said light compartment axially through a top end of said housing;



a limit switch on said light compartment for limiting axial extension of said light compartment from said housing;

complementary sliding electrical contacts on said light compartment and on said housing for supplying electrical current to said electric light in said light compartment; and

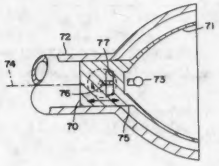
solar power means for energizing said light and said motor.

4,984,140

HAND HELD FLASHLIGHT WITH SELECTIVE BEAM AND ENHANCED APPARENT BRIGHTNESS

M. Edmund Ellion, 2152 Highland Oaks Dr., Arcadia, Calif. 91006

Filed Jul. 19, 1989, Ser. No. 382,426
Int. Cl.[5] F21L *15/02*
U.S. Cl. 362—187 **5 Claims**



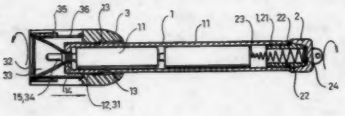
1. A flashlight having a projection axis, a light source, and a reflector, said reflector having a specularly reflective surface on said axis which forms a cavity receiving a light source, said reflective surface comprising a paraboloid having a focus, and said flashlight including means for mounting said light source and reflector relative to one another so that said light source can selectively be positioned at said focus to provide a spot beam, or can be displaced axially from said focus to provide a broader beam, said reflector surface further including a frustoconical surface as a tangent continuation of said paraboloid to reflect light from said source to illuminate a dark section of the beam which otherwise results when the light source is displaced from said focus.

4,984,141

WARNING AND LIGHTING FLASH LIGHT

Larry Lai; Zong-Syh Lai, and Der-Shen Lai, all of ChiaYi Hsien, Taiwan, assignors to Plum Industrial Co., Ltd., ChiaYi Hsien, Taiwan

Filed Feb. 15, 1990, Ser. No. 479,671
Int. Cl.[5] F21L *15/02*
U.S. Cl. 362—187 2 Claims



1. A warning & lighting flash light comprising;

a cylindrical tube made of a conductive material for containing dry cells and having a female-threaded rear end to screw with a smaller diameter male-threaded portion of a rear lid, the front end having a male-threaded portion for a front cap to screw with and a female-threaded portion for a lamp to screw with;

a rear lid having a smaller diameter male-threaded portion to screw with the female-threaded rear end of the tube, the male-threaded portion being unconductive and having a hollow interior for a metal spring to fit therein to urge dry cells and to contact with a conductive portion of the rear lid so that the electric current from the dry cells can be transmitted through the rear lid to the tube, the rear lid being adjustably rotated so that the conductive portion may be in contact with or separated from the tube to function as a switch;

a front cap having a female-threaded rear portion to screw with the male-threaded portion of the front end of the tube and a circumferential light passing portion at the middle section, a reflective mirror in the interior, the light passing portion being covered with a colored filter, and the reflective mirror having a central hole for the lamp to extend through or retreat back; and

the front cap being possible to be rotated around the front end of the tube either deeply enough to make the central hole in the reflective mirror to be extended through by the lamp so that the light of the lamp can be reflected forward, or shallowly enough to position the reflective mirror in front of the lamp so that substantially all of the light of the lamp can be emitted through the light passing portion.

4,984,142

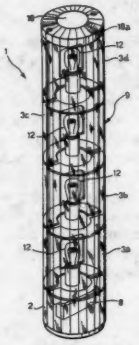
OPTICAL INDICATOR

Alberto Garnerone, Rosta, Italy, assignor to Sirena S.p.A., Turin, Italy

Filed Jun. 4, 1990, Ser. No. 532,409
Claims priority, application Italy, Jul. 11, 1989, 53241/89[U]
Int. Cl.[5] F21V *21/00*
U.S. Cl. 362—249 3 Claims

1. An optical indicator, particularly but not exclusively for industrial use, comprising an elongate hollow casing with at least two longitudinal bands which are at least partially transparent, a support structure within the casing, at least two bulbs carried by the support structure in positions corresponding to the bands of the casing, electrical terminals which are arranged at one end of the support structure and to which the bulbs are connected, and at least one electrical connector coupled to the said end of the bulb-holder structure and arranged to allow the bulbs to be connected to circuit-operating devices outside the casing,

wherein the elongate hollow casing has a first end which is intended to be connected firmly to a support part in use and in which the connector is fixed, and a second end which is open and the bulb-holder structure is mounted in the elongate hollow casing so as to be removable through the second end thereof, and wherein a closure member is fixed to the end of the structure opposite the connector and is adapted to be coupled to the second end of the casing with mutual lateral covering over a predetermined



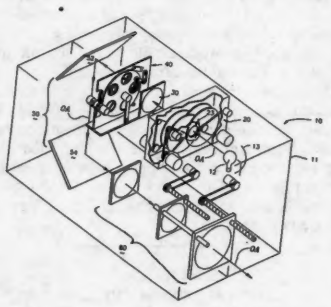
axial length such that, when the bulb-holder structure is removed from the casing, it is disconnected from the connector before the closure member is disconnected from the elongate hollow casing to an extent sufficient to allow access to the interior of the elongate hollow casing.

4,984,143

COLOR FILTER CHANGER

Brian E. Richardson, San Jose, Calif., assignor to Morpheus Lights, Inc., San Jose, Calif.

Continuation of Ser. No. 224,456, Jul. 26, 1988, Pat. No. 4,914,556. This application Sep. 14, 1989, Ser. No. 407,392
Int. Cl.[5] G02B *5/22;* F21V *9/00*
U.S. Cl. 362—293 11 Claims



1. Spotlight color filter changer means for adjustably attenuating selectable bands of color of light in a beam projected along an optical axis, comprising:

three color component hue filter disks each having a substrate with a planar surface for rotating around a corresponding rotation axis normal thereto, and supporting a respective primary subtractive hue dichroic filtering medium distributed so that surface areas of equal sizes surrounding points along an arcuate gradient axis at all angles increasingly from one end of said gradient axis around said rotation axis to the other end increasingly attenuate the saturations of respective hues of light in said beam intersecting those areas through said disk; and

component filter disk changer means including respective

drive mechanisms for independently and adjustably rotating each said component hue filter disk.

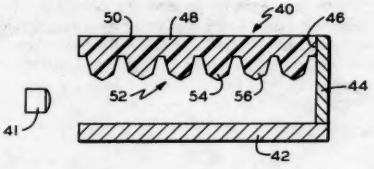
4,984,144
HIGH ASPECT RATIO LIGHT FIXTURE AND FILM FOR USE THEREIN

Sanford Cobb, Jr., St. Mary's Point, and John F. Dreyer, Jr., North Oaks, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 47,644, May 8, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 181,652

Int. Cl.[5] F21V *5/02*

U.S. Cl. 362—339 **9 Claims**



1. A high aspect ratio light fixture comprising an enclosure having an optical window, said light fixture comprising:

transparent light extraction film in said optical window, said light extraction film having a base layer defining a plane and having a structured surface facing the interior of said enclosure, said surface having linear prisms thereon, each of said prisms having two sides adjacent to said plane, the projections of which meet at a relatively narrow angle and two sides more distant from said plane which meet at a relatively wide angle; and

a light source at one end of said enclosure for emitting light such that said light will enter said prisms, be totally internally reflected and emerge through said second surface.

4,984,145
CIRCUIT ARRANGEMENT FOR FREE-RUNNING BLOCKING-OSCILLATOR TYPE SWITCHED POWER PACK

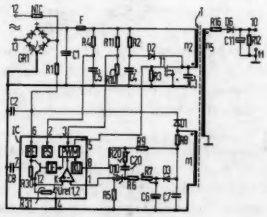
Rainer Dangschat, Landsham, and Ernst Paulik, Hilgertshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1990, Ser. No. 470,250

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902164

Int. Cl.[5] H02M *3/338*

U.S. Cl. 363—19 **7 Claims**



1. A circuit arrangement for a free-running blocking-oscillator-type switched power pack for generating an output voltage, comprising:

a transformer having a first winding;

an electrical switch element connected said first winding of said transformer;

a control means for pulse width modulated driving of said electrical switch element to cause a clocked application of a DC voltage to said first winding of said transformer, said control means having:

a first input post connected for receiving at least one primary current signal;

a second input post connected to receive a zero-axis crossing signal which identifies a pulse start,

a comparator amplifier operable to produce a difference signal that defines a pulse width, said comparator amplifier having first and second control inputs;

a reference voltage means for forming an internal reference signal, said reference voltage means being connected to supply said internal reference signal to said first control input of said comparator amplifier;

a third input post connected to receive a control voltage that is dependent upon said output voltage, said third input post being connected to supply said control voltage to said second control input of said comparator amplifier;

a capacitive switching matrix array connected between said second and third input posts, said matrix array causing a reduction in operating frequency in standby mode for the circuit arrangement; and

a detector means for sensing a beginning of the standby mode by a reduction in the operating frequency, said detector means being connected to said reference voltage means to reduce said reference signal during the standby mode.

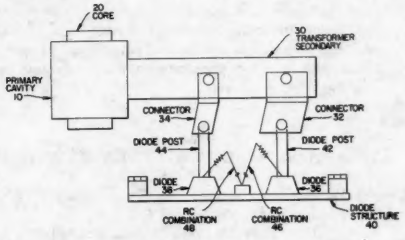
4,984,146
SUPPRESSION OF RADIATED EMI FOR POWER SUPPLIES

Arthur G. Black, Red Hook; John R. Mazzuca, Kingston; Carl J. Palmucci, Kingston, and Surya K. Rao, Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1990, Ser. No. 499,835

Int. Cl.[5] H02M *7/06*

U.S. Cl. 363—44 **8 Claims**



1. An electrical power supply comprising:

primary and secondary windings;

an output filter;

a first diode having an anode electrically connected to a first end of said secondary winding and a cathode connected to a first input of said output filter, said first diode anode connection having a first series impedance between said secondary winding and said first diode anode;

a second diode having an anode electrically connected to a first end of said secondary winding and a cathode connected to said first input of said output filter, said second diode anode connection having a second series impedance between said secondary winding and said second diode anode;

said first diode anode connection spaced apart from said second diode anode connection and from said secondary

winding to provide separately adjustable impedances for each of said anode connections;

said first series impedance and said second series impedance suppressing radiated electromagnetic interference; and

a second end of said secondary winding connected to a second input of said output filter.

4,984,147

CONTROL METHOD FOR PWM CONVERTER

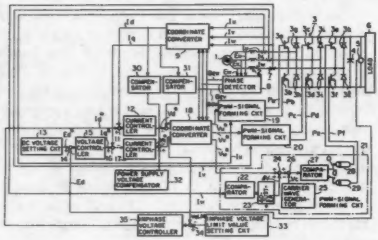
Hiroshi Araki, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisah, Japan

Filed Mar. 22, 1990, Ser. No. 497,185

Claims priority, application Japan, May 12, 1989, 1-119416

Int. Cl.[5] H02M 7/04

U.S. Cl. 363—84 1 Claim



1. A control method for a PWM converter, being provided with a PWM controlled power converter for converting AC power supplied from an AC power supply to DC power, comprising:

a first step of setting an upper limit value of an inphase-voltage set-value, being in phase with the AC power supply, of an instruction voltage which controls said power converter, and

a second step of limiting the inphase-voltage set-value of said instruction voltage up to said upper limit value by setting a reactive-voltage set-value of the instruction voltage whose phase is orthogonal with the AC power supply and whose amplitude is equivalent to a surplus of the inphase-voltage set-value of the instruction voltage to said upper limit value in case of the inphase-voltage set-value exceeding the upper limit value.

4,984,148

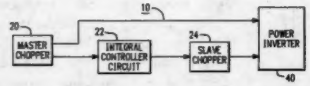
TWO-PHASE BANG-BANG CURRENT CONTROL SYNCHRONIZER

Charles W. Edwards, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1990, Ser. No. 529,843

Int. Cl.[5] H02M 3/24

U.S. Cl. 363—95 5 Claims



5. A two-phase bang-bang current control synchronizer, comprising:

master chopper means for generating a fixed hysteresis threshold voltage;

integral controller means, for generating a synchronizing sawtooth signal having an average value substantially the same as the average value of said fixed hysteresis threshold voltage, said integral controller means comprising:

summer means for receiving the fixed hysteresis threshold voltage from said master chopper means and the synchronizing sawtooth signal, and for outputting a summed signal varying in response to the synchronizing sawtooth signal;

an integral controller, operatively connected to said summer means, for receiving and integrating the summed signal and outputting an integrated signal responsive to said summed signal; and

synchronization means for receiving the integrated signal and generating the synchronizing sawtooth signal responsive to said integrated signal; and

slave chopper means, operatively connected to said integral controller means, for generating a ramped threshold voltage in response to the synchronizing sawtooth signal from said integral controller, and the fixed threshold voltage, the output from said slave chopper and said master chopper being input to a power inverter.

4,984,149

MEMORY ACCESS CONTROL APPARATUS

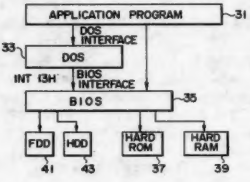
Takashi Iwashita, Saitama; Koichi Awazu, and Kiyoshi Murase, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1988, Ser. No. 173,819

Claims priority, application Japan, Mar. 28, 1987, 62-74829; Aug. 27, 1987, 62-211466

Int. Cl.[5] G06F 12/00

U.S. Cl. 364—200 14 Claims



1. A memory access control apparatus, comprising:

external file units including an integrated circuit (IC) disk unit, which uses a random access memory (RAM) as part of a disk to be managed by a disk operation system, and a read only memory (ROM) as the other part of the disk, and said external file units having access address and transfer length which are represented by a format of a sector;

means for issuing an access request to said external file units, the access request including information designating that the access request is directed to said IC disk unit;

access request determining means for detecting that the access request is directed to said IC disk unit to output a detection signal; and

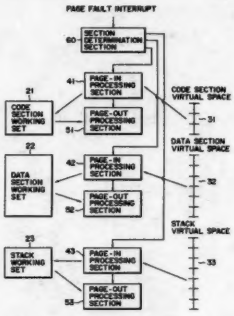
address translating means for, in response to the detection signal output from said access request determining means, translating the sector form address into a byte form address.

4,984,150

VIRTUAL MEMORY CONTROL MANAGEMENT SYSTEM

Ryoya Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1988, Ser. No. 248,842
Claims priority, application Japan, Sep. 29, 1987, 62-245427
Int. Cl.[5] G06F *12/08*
U.S. Cl. 364—200 5 Claims



1. A virtual memory control management system having a demand paging function, comprising:

a plurality of working set means, each provided for respective ones of a plurality of program sections that constitute a task, for registering virtual pages to which real pages are allocated, the sections being distinguished in accordance with how the sections are used by the task;

determining means for receiving an externally supplied page fault caused by a virtual page and for determining a section of a task being executed to which the virtual page causing the page fault is allocated;

page-in means for performing page-in processing for registering the virtual page causing the page fault in said working set means corresponding to the section of the task being executed determined by said determining means; and

page-out means for selecting one of the virtual pages registered in the working set means corresponding to the section determined by said determining means and for canceling the selected page, whereby said page-in means registers the virtual page causing the page fault in the working set means.

4,984,151

FLEXIBLE, NEXT-ADDRESS GENERATION MICROPROGRAM SEQUENCER

Vineet Dujari, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 707,365, Mar. 1, 1985, abandoned. This application Aug. 2, 1988, Ser. No. 227,452
Int. Cl.[5] G06F *9/26*
U.S. Cl. 364—200 13 Claims

1. A sequencer for generating a next-address in the execution of a micro-program, said sequencer comprising:

(a) means for final selection of an address from a plurality of potential next-addresses and for providing the finally selected next-address as the next-address in the execution of said micro-program;

(b) stack register array means for storing a plurality of micro-program values, including micro-program addresses, in a last-in/first-out stack register array manner;

(c) means for providing a micro-program address offset value; and

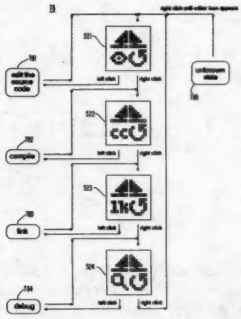
(d) means for adding said micro-program address offset value and the last-in one of the micro-program values stored in said last-in/first-out stack register array to generate a micro-program address relative to a value stored in said last-in/first-out stack register array as one of said plurality of potential next-addresses provided to said final selection means.

4,984,152

SYSTEM FOR CONTROLLING COMPUTER PROCESSING UTILIZING A MULTIFUNCTIONAL CURSOR WITH DECOUPLING OF POINTER AND IMAGE FUNCTIONALITIES IN SPACE AND TIME

Michael J. Muller, Highland Park, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Oct. 6, 1987, Ser. No. 106,587
Int. Cl.[5] G06F *3/02, 3/033*
U.S. Cl. 364—200 5 Claims



1. A method for operating an interactive computer system having a memory, a screen display serving as a user interface, and a device to control movement of information on the screen and to communicate the information associated with the screen to the system, said method comprising the steps of

assigning a first area of the memory which corresponds to a movable region of the screen to display a pointer region, wherein said pointer region is movable about the screen display by changing the contents of the memory under control of the user,

assigning a second area of the memory which corresponds to a relocatable region of the region, decoupled from said pointer region, to display an image region, wherein said image region is movable about the screen display by changing the contents of the memory under control of the user,

displaying a pointer in said pointer region,

selecting a computer operation from a menu list of computer operations displayed on the screen display by moving said pointer to said computer operation on said menu list and executing a user-invoked select-event and storing said selected operation in the memory for later recall, wherein said operation, when recalled and invoked by the user, activates said selected computer operation for computer processing of a data object displayed on the screen and pointed at by said pointer, said step of selecting including the steps of

positioning, under control of the device, said pointer region onto one of the said operations to select said operation, and

transmitting an image icon from the system to the screen in response to operating the device to acknowledge the selection of said operation,

saving, as predetermined screen contents, the contents of the screen prior to any display of said image region,

displaying the image icon in said image region by presenting both said image region and said image icon on the screen

after an assignable time interval following cessation of any movement of the device, and

displaying said predetermined screen contents during movement of the device.

4,984,153

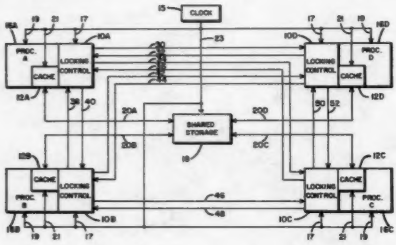
STORAGE LOCKING CONTROL FOR A PLURALITY OF PROCESSORS WHICH SHARE A COMMON STORAGE UNIT

Glen R. Kregness, Minnetonka; Clarence W. Dekarske, St. Paul Park, and Lawrence R. Fontaine, Minneapolis, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 27, 1988, Ser. No. 186,827

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—200 **8 Claims**



1. A method of establishing locks in a data processing system on selected portions of an addressable storage means that is shared by a plurality of processors that comprise said data processing system comprising,

(a) transmitting request address codes which are representative of said selected portions upon which said requesting processors request a lock, from requesting processors to all of said other processors of said plurality of processors,

(b) storing in each of a plurality of memories, each of which memories is associated with one of said processors all of the request address codes that are transmitted at a first time by any of said processors,

(c) comparing at a second time later than said first time a request address codes that was transmitted to said other processors by a requesting processor with request address codes that were received by said requesting processor from said other processors and that were stored in the memory associated with said requesting processor at said first time,

(d) establishing priority rankings for all of said processors and transmitting indications of said rankings to all of said processors,

(e) comparing again at a third later time later than said second time the locking request address code that was transmitted to said other processors by a requesting processor with only those request address codes of said other processors that were received by said requesting processor from other processors that have a higher priority ranking than said requesting processor, wherein said third time occurs substantially immediately following the receipt by each of said processors of the request address codes that were transmitted at said first time from said other processors, and

(f) granting a lock for said requesting processors on the requested portions of said shared addressable storage means that are represented by the request address codes that were transmitted by said requesting processors only if no comparison much of the request address code for a requesting processor occurred at either of said second or third times.

4,984,154

INSTRUCTION PREFETCHING DEVICE WITH PREDICTION OF A BRANCH DESTINATION ADDRESS

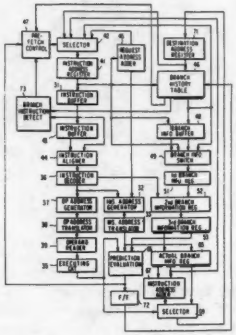
Syuichi Hanatani; Masanobu Akagi; Kouemon Nigo; Ritsuo Sugaya, and Toshiteru Shibuya, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 552,223, Nov. 16, 1983, abandoned. This application Dec. 19, 1988, Ser. No. 286,021

Claims priority, application Japan, Nov. 17, 1982, 57-201550; Nov. 17, 1982, 57-201555; Nov. 17, 1982, 57-201556; Nov. 17, 1982, 57-201557; Nov. 17, 1982, 57-201558; Nov. 17, 1982, 57-201559; Mar. 29, 1983, 58-52946

Int. Cl.[5] G06F *9/26*

U.S. Cl. 364—200 **8 Claims**



1. An instruction prefetching device for use in carrying out prefetch of an instruction sequence in a data processing system which includes an executing unit and current instruction address means for specifying the address of a current instruction to be executed, wherein said executing unit executes the current instruction to obtain a result of execution, said instruction prefetching device comprising:

a branch history table for storing a plurality of entry pairs, each entry pair comprising a first entry specifying an instruction address of a branch instruction executed by said executing unit prior to said prefetch and a second entry specifying branch information which comprises a branch destination address obtained by execution of said branch instruction, said branch history table comprising a directory memory having a predetermined number of directory blocks for storing the first entries of said entry pairs and a data memory having a plurality of data blocks corresponding to respective ones of said directory blocks, said data blocks storing the respectively associated second entries of said entry pairs, said branch history table storing a plurality of entry pairs having first entries each specifying the same branch instruction address:

retrieving means coupled to said current instruction address means and responsive to a current instruction address for locating in said branch history table any first entries which specify the current instruction address as a branch instruction address and for retrieving an associated second entry from said branch history table when one of said first entries is located, said retrieving means comprising first means responsive to said current instruction address for locating in said branch history table any first entries which specify the current instruction address as a branch instruction address, second means for selecting a particular one of said located first entries when said located first entries are more than one, said selected first entry representing a selected instruction address for a branch instruction to be prefetched next, and third means responsive to said selected instruction address for selecting the second entry

stored in the data block corresponding to the directory block storing said selected first entry; and

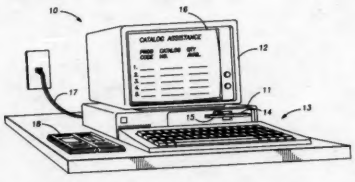
prefetching means responsive to said selected second entry for carrying out said prefetch, said prefetching means comprising: prediction evaluating means responsive to said selected second entry and said result of execution for evaluating said selected second entry to produce a prediction evaluation signal indicative of whether the branch destination address of the branch information specified by said selected second entry is consistent or inconsistent with said result of execution; and controlling means coupled to said prediction evaluating means for determining when said prediction evaluation signal indicates that the branch destination address of the branch information specified by said selected second entry is consistent or inconsistent with said result of execution, and responsive to said prediction evaluation signal for controlling said prefetch to be continued in response to said selected second entry when said prediction evaluation signal indicates that the branch destination address of the branch information specified by said corresponding second entry is consistent with said result of execution and for controlling said prefetch to be continued in response to said result of execution when said prediction evaluation signal indicates that the branch destination address of the branch information specified by said selected second entry is inconsistent with said result of execution.

4,984,155

ORDER ENTRY SYSTEM HAVING CATALOG ASSISTANCE

Raymond R. Geier, Florence; Charles L. Smiley, Burlington, and Robert L. Stanger, Ft. Thomas, all of Ky., assignors to Square D Company, Palatine, Ill.

Filed Aug. 29, 1988, Ser. No. 237,895
Int. Cl.[5] H04M *11/00*
U.S. Cl. 364—401 **19 Claims**



1. A method of operating a computer system for ordering products requested by customers from terminals at customer locations, said computer system having a memory storing information defining respective products, said information including catalog numbers, said catalog numbers being used in a catalog distributed by said supplier to said customers to identify said products, said method comprising the steps of:

(a) receiving from one of said terminals a number specified by a respective customer, said number being different from said catalog numbers in said catalog number index;

(b) searching said memory to find information about a plurality of said products including catalog numbers that only partially match the number specified by said respective customer;

(c) transmitting to said one of said terminals said information about said plurality of products that was found in step (b);

(d) receiving from said one of said terminals an order by said respective customer for one of said products selected by said respective customer in response to said step (c) of transmitting said information about said plurality of products; and

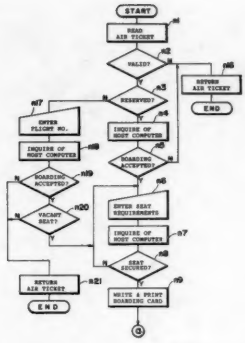
(e) processing said order at an order processing location.

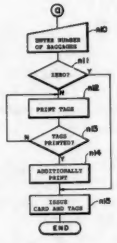
4,984,156

AUTOMATIC CHECKIN APPARATUS

Yoshikazu Mekata, Kusatsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 2, 1987, Ser. No. 127,376
Claims priority, application Japan, Dec. 5, 1986, 61-291143
Int. Cl.[5] G07B *11/00*
U.S. Cl. 364—407 **4 Claims**





1. A method of automatically checking-in passengers which comprise the steps of:

(a) reading data recorded on an air ticket;

(b) checking whether the read air ticket is valid;

(c) if the air ticket is valid, checking whether the air ticket is a reserved ticket;

(d) if the air ticket is a reserved ticket, inquiring of a host computer if boarding is accepted;

(e) if boarding is accepted, entering seat requirements;

(f) inquiring of the host computer about the entered seat requirements to secure a seat under the entered seat requirements;

(g) if a seat is secured, printing and recording at least one item of flight data on a boarding card;

(h) reading data entered at a baggage number input means indicative of the number of bags to be checked;

(i) if the number of bags to be checked is not zero, printing a number of tags corresponding in number to the entered data indicative of the number of bags to be checked; and

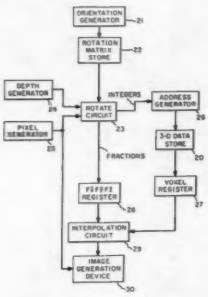
(j) issuing a boarding ticket and said printed tags and stocking the air ticket.

4,984,157

SYSTEM AND METHOD FOR DISPLAYING OBLIQUE PLANAR CROSS SECTIONS OF A SOLID BODY USING TRI-LINEAR INTERPOLATION TO DETERMINE PIXEL POSITION DATAES

Harvey E. Cline, Schenectady; William E. Lorensen, Ballston Lake, and Siegwalt Ludke, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,183
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—413.13 **12 Claims**



5. A system for displaying cross-sectional images of a three-dimensional body, said system comprising:

means for storing a three-dimensional array of values of at least one physical property at regularly located points in the interior of said body;

means for translating a planar array of pixel positions to correspond with an arbitrarily selected cut plane through said body;

means for tri-linearly interpolating a value for each said translated pixel position from the voxel vertex values surrounding said translated pixel position; and

means for displaying said interpolated values.

11. A system for displaying two-dimensional images of three-dimensional data arrays, said system comprising:

means for storing an array of signal values representing the value of a physical property at each of a plurality of grid positions within a three-dimensional body;

means for selecting a viewing surface for viewing the internal structure of said three-dimensional body;

means for tri-linearly interpolating picture element values at each of a plurality of picture element positions substantially on said viewing surface from the physical values in each said array surrounding each respective one of said picture element positions; and

means for displaying said picture element values at corresponding picture element positions on said viewing surface.

4,984,158

METERED DOSE INHALER BIOFEEDBACK TRAINING AND EVALUATION SYSTEM

Deane Hillsman, 870 El Chorro Way, Sacramento, Calif. 95864

Filed Oct. 14, 1988, Ser. No. 257,550
Int. Cl.[5] A61B *5/08*; G09B *19/00*; G06F *15/42*
U.S. Cl. 364—413.04 **16 Claims**

1. Inhalation therapy apparatus for enhancing patient performance during inhalation of aerosol treatment materials comprising:

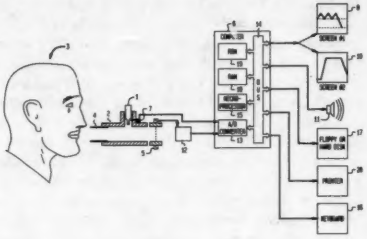
airflow conduit means for receiving inspiration and expiration air from the patient;

manually activated means for introducing a metered dose of aerosol treatment material or placebo substitute into the airflow conduit means;

means for measuring patient inspiration and expiration airflow and generating a first signal representative of said airflow;

means for determining a cyclic expiration point representative of lung exhaustion and generating a second signal upon lung exhaustion;

dosage signal means responsive to said second lung exhaustion signal to indicate to the patient to begin an inspiration



cycle and substantially simultaneous manual activation of said manually activated means;

means for indicating completion of air intake in said inspiration cycle and manual activation of said manually activated means; and

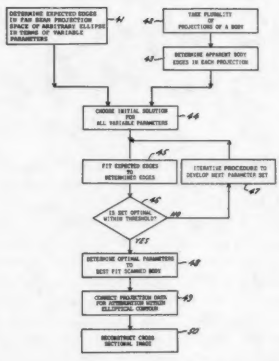
means for indicating to the patient a prescribed inhalation airflow pattern.

4,984,159

METHOD AND APPARATUS FOR ESTIMATING ELLIPTICAL BODY CONTOURS IN FAN BEAM COMPUTED TOMOGRAPHIC SYSTEMS

Grant T. Gullberg, Salt Lake City, Utah, assignor to General Electric Company, Milwaukee, Wis.

Filed Aug. 9, 1988, Ser. No. 230,064
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—413.16 **18 Claims**


DETERMINE EXPECTED EDGES IN FAN BEAM PROJECTION SPACE OF ARBITRARY ELLIPSE IN TERMS OF VARIABLE PARAMETERS
41
TAKE PLURALITY OF PROJECTIONS OF A BODY
42
DETERMINE APPARENT BODY EDGES IN EACH PROJECTION
43
CHOOSE INITIAL SOLUTION FOR ALL VARIABLE PARAMETERS
44
FIT EXPECTED EDGES TO DETERMINED EDGES
45
ITERATIVE PROCEDURE TO DEVELOP NEXT PARAMETER SET
47
IS SET OPTIMAL WITHIN THRESHOLD?
46
YES
DETERMINE OPTIMAL PARAMETERS TO BEST FIT SCANNED BODY
48
CORRECT PROJECTION DATA FOR DIVERGENCE OF BEAM ELLIPTICAL CORRECTION
49
RECONSTRUCT CROSS SECTIONAL IMAGE
50

1. In fan beam computed tomographic systems having a detector system for taking a plurality of projections of a scanned body at a plurality of angles, a method of estimating the contour of the body comprising the steps of:

determining expected edges of an arbitrary ellipse in fan beam projection space at each angle in terms of variable elliptical parameters;

taking a plurality of fan beam projections of a body being scanned at a plurality of angles;

determining from each fan beam projection the fan beam

coordinates of the apparent body edge in each of the projections;

fitting the expected edges of the projected ellipse to the determined edge coordinates for each fan beam projection by iteratively optimizing a function relating all of the variable parameters of the arbitrary ellipse to determine a final set of parameters which defines an elliptical contour which best fits the scanned body, and

processing the fan beam projections in conjunction with the defined elliptical contour to produce a reconstructed cross sectional image of the scanned body within the defined elliptical contour.

4,984,160

METHOD FOR IMAGE RECONSTRUCTION THROUGH SELECTION OF OBJECT REGIONS FOR IMAGING BY A COMPARISON OF NOISE STATISTICAL MEASURE

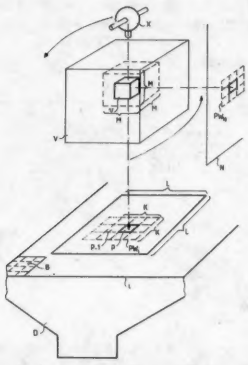
Didier Saint Felix, Boulogne; Ann rougee, Fontenay Aux Roses, and Yves Trousset, Paris, all of France, assignors to General Elecrtric CGR SA, Issy les Moulineaux, France

Filed Jan. 25, 1989, Ser. No. 301,904

Claims priority, application France, Dec. 22, 1988, 88 17001

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.19 **8 Claims**



1. A method of reconstruction and processing of an image of a three-dimensional object, comprising:

subjecting the object, in different orientations corresponding to views, to radiological examinations during which an x-radiation which passes through the object is measured each time by a two-dimensional detector in order to produce a set of measurement data for each view;

storing said measurement data;

processing said measurement data in two stages in order to reconstruct the image of the object, a first stage designated as a detection stage being followed by a second stage designated as an estimation stage,

the detection stage determining a geometrical support region of the object, said support region comprising all the volume elements or voxels which belong to the object,

the detection stage evaluation the statistics of the signal measured in a view and corresponding to a region of the object, and making a decision for incorporating said region of the object in the support region as a function of the comparison of said statistics with the statistics of a measurement noise, and

the estimation stage reconstructing portions of the image of the object which are contained in the support region; and

processing the image of the object thus reconstructed.

4,984,161

METHOD FOR CONTROLLING AUTOMATIC TRANSMISSIONS

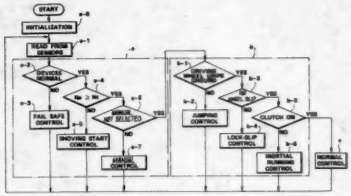
Takeshi Nakazawa; Jun Hashimoto; Shinichi Nakamura; Katsumi Yamazaki, all of Saitama; Yoshihiro Nakajima; Tsutomu Hayashi, both of Tokyo; Tetsuya Ichikawa, Saitama; Nobuyuki Yakigaya, Chiba; Kiyoshi Katahira, and Yoshinobu Takeshima, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,707

Claims priority, application Japan, Mar. 24, 1987, 62-70090; Mar. 24, 1987, 62-70091; Mar. 27, 1987, 62-73577; Apr. 6, 1987, 62-84237; Apr. 7, 1987, 62-84991; Sep. 1, 1987, 62-218757; Oct. 16, 1987, 62-261126; Dec. 11, 1987, 62-313872

Int. Cl.[5] B60K *41/12, 41/18;* G06F *15/48*

U.S. Cl. 364—424.1 **28 Claims**



1. A method for controlling an automatic transmission for a vehicle with an engine, said automatic transmission being capable of continuously varying a transmission ratio and a transmission coefficient, said method comprising the steps of:

(a) automatically selecting and setting said transmission ratio according to an initial stage control procedure when a speed of said vehicle is lower than a prescribed value;

(b) automatically selecting and setting said transmission ratio according to a special stage control procedure in a condition that said vehicle is out of said initial stage control procedure and a transmission for transmitting a driving force from an engine to the ground is disconnected at least at one part; and

(c) automatically selecting and setting said transmission ratio according to a normal stage control procedure in a condition that said vehicle is out of both said initial stage control and said special stage control.

4,984,162

WORD PROCESSOR WITH A MARGIN TEXT EDIT FUNCTION

Hiroshi Torii, Inazawa; Minoru Oishi, Nagoya; Tomohiro Ban, Iwakura; Akihiro Furukawa; Tokihito Furushima, both of Nagoya, and Kazuko Nakagawa, Chita, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 72,403, Jul. 13, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 386,635

Claims priority, application Japan, Jul. 15, 1986, 61-166211

Int. Cl.[5] G05B *15/00*

U.S. Cl. 364—518 **13 Claims**

1. A word processor operable both in a main text edit mode and in a margin text edit mode comprising:

display means attached to the word processor for displaying text data of plural lines;

main text edit means that function only in the main text edit mode for editing a main text displayed on the display means;

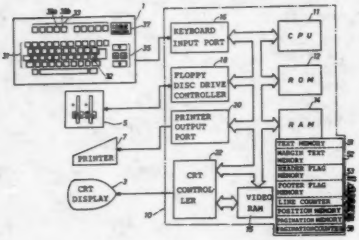
margin text edit means that function only in the margin text edit mode for editing a margin text displayed on the display means, wherein the margin text is to be printed in a margin outside the main text on a paper;

print means attached to the word processor for printing the main text with the margin text on the paper upon command;

means for placing the word processor in one of the main text edit and margin text edit modes;

first display control means that function only in the main text edit mode for displaying only a portion of the main text on the display means;

second display control means that function only in the margin text edit mode for displaying the margin text within a margin text frame, which expands or contracts according to a change in a number of margin text lines, in a first region of the display means and for displaying and adjusting up and/or down a portion of the main text compensating for the change in the number of margin text lines; wherein



the second display control means displays a bottom line of a page of the main text just above the margin text frame when the first region is displayed below the second region and automatically scrolls the main text to change the bottom line to compensate for the expansion and contraction of the margin text frame on a line for line basis; and

the second display control means displays a top line of a page of the main text just below the margin text frame when the first region is displayed above the second region and automatically scrolls the main text to change the bottom line to compensate for the expansion and contraction of the margin text frame on a line for line basis.

4,984,163

ROAD SURFACE CONDITION DETECTING AND ANTI-SKID CONTROLLING DEVICE IN CAR

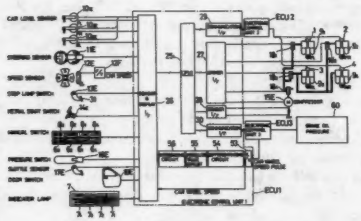
Kazutaka Kuwana, Toyota; Tsuyoshi Yoshida, Obu, and Kenji Tozu, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 31, 1989, Ser. No. 386,781

Claims priority, application Japan, Jul. 29, 1988, 63-190899

Int. Cl.[5] B60T *8/58*

U.S. Cl. 364—426.02 **3 Claims**



3. Anti-skid control device comprising:

a brake pressure source for generating a high pressure and a low pressure;

valve means which is interposed between said brake pressure source and a car wheel brake, for connecting a liquid flow path between said car wheel brake and said high pressure and low pressure of said brake pressure source;

car wheel rotation speed detecting means for detecting rotational speed of a car wheel equipped with said car wheel brake;

calculating means for calculating car speed on the basis of said car wheel rotation speed;

means for calculating a speed changing rate of said car wheel rotation speed;

integrating means for integrating an absolute value of the speed changing rate;

comparing means for comparing an integrated value of said integrating means with a set value for road surface condition judgment; and

brake pressure control means for controlling low pressure/high pressure connection of said car wheel brake by driving said valve means in response to a compared result of said car wheel rotation speed and said car speed and said comparing means.

4,984,164

ANTI-LOCK CONTROL METHOD AND APPARATUS FOR VEHICLES

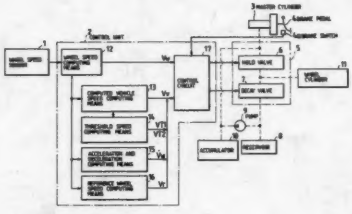
Toshifumi Machara, and Satomi Okubo, both of Saitama, Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed Sep. 6, 1989, Ser. No. 403,375

Claims priority, application Japan, Sep. 8, 1988, 63-223591

Int. Cl.[5] B60T *8/58*

U.S. Cl. 364—426.02 **5 Claims**



2. An anti-lock control apparatus for a vehicle, comprising:

means for sensing respective wheel speeds of wheels of the vehicle;

means for braking the vehicle wheels;

means for controlling said braking means according to an output of said sensing means, said control means setting a vehicle speed and first and second threshold speeds, said first and second threshold speeds corresponding over time to said vehicle speed with a prescribed speed difference that is constant over said time so as to satisfy a relation $Vv > VT1 > VT2$, where Vv, VT1 and VT2 represent said vehicle speed, said first and second threshold speeds, respectively; and

means for setting a reference wheel speed, said reference wheel speed decreasing linearly in time with a predetermined deceleration from an initial reference wheel speed $(Vw - \Delta V)$ which is lower than said wheel Vw speed by a predetermined value ΔV when said wheel speed attains said predetermined deceleration in response to said vehicle wheel braking means,

wherein said control means controls said braking means to decrease the brake hydraulic pressure during a period which begins from a first time point whichever happens sooner between a time at which said wheel speed becomes equal to or lower than said reference wheel speed at a time point at which said wheel speed becomes equal to or lower than said first threshold speed, said period ending at a second time point whichever happens sooner between a first possible time point

at which said wheel speed attains a low peak and a second possible time point, said second possible time point being defined whereby after said wheel speed has dropped to below said second threshold speed, said wheel speed becomes higher than said second threshold speed.

4,984,165

METHOD AND APPARATUS FOR ADAPTING SLIP THRESHOLD VALUES FOR A PROPULSION SLIP AND/OR BRAKING SLIP CONTROL SYSTEM TO THE TIRES OF A MOTOR VEHICLE

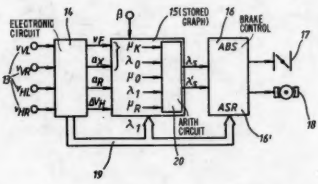
Armin Müller, Backnang, and Hartmut Cordt, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 279,810

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741247

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 **4 Claims**



4. Apparatus for adapting slip threshold values for at least one of a propulsion slip and braking slip control system to existing wheels of a motor vehicle, comprising:

sensor means for measuring the circumferential speeds of the vehicle wheels;

means for determining the required operational parameters to create the curves and graphs from output signals created by the sensor means;

means for producing output signals responsive to a predeterminable slip value for at least one of a non-driven and a driven vehicle wheel;

means for determining signals of vehicle speed (vf) and vehicle longitudinal acceleration (a_x) from the output signals of the sensor means and for creating a coefficient of friction (μ_K) value associated with the vehicle speed and vehicle longitudinal acceleration which are parameters used to create the graphs, said means for determining and creating including means for substituting for the predetermined slip value (λ_o) an actual slip value (λ_l) measured at the driven wheels of the vehicle when the motor vehicle is in an operational state defined by a measurement window associated with the said coefficient of friction within the graphs, and the conditions of the vehicle show:

(a) the vehicle is travelling straight ahead;

(b) no speed differential of the driven wheels of the vehicle exists;

(c) any acceleration of the driven wheels is equal to the vehicle longitudinal acceleration; and

(d) no propulsion slip or braking slip control operation being simultaneously undertaken;

an arithmetic circuit means, coupled to the means for determining and creating, for converting the predetermined slip value (λ_o) by predetermined coefficients of friction and of a predetermined function ($\lambda = f(\mu)$) to corresponding slip threshold values (λ_s; λ'_s) and to utilize the created corresponding slip threshold values as inputs to at least one of said braking slip control system and propulsion slip control system, by which said created corresponding slip threshold values are further processed into control signals for controlling at least one of the propulsion system and the brakes of the vehicle.

4,984,166

AUTOMOTIVE CONSTANT SPEED CRUISE CONTROL SYSTEM

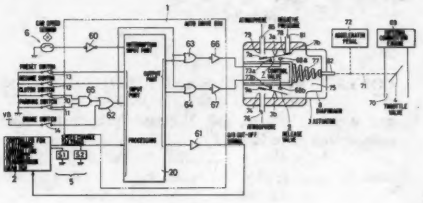
Tatsuo Teratani; Takeshi Tachibana; Shigetaka Akabori; Masumi Nagasaka; Hiroaki Tabuchi, all of Toyota; Junji Takahashi, Kobe; Akira Miyazaki, Kobe; Masaki Hitotsuya, Kobe, and Minoru Takahashi, Kobe, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi and Fujitsu Ten Limited, Hyogo, both of, Japan

Continuation of Ser. No. 948,135, Dec. 29, 1986, abandoned. This application May 2, 1989, Ser. No. 348,098

Claims priority, application Japan, Dec. 27, 1985, 60-298126; Dec. 27, 1985, 60-298128; Dec. 27, 1985, 60-298129; Dec. 28, 1985, 60-298847; Dec. 28, 1985, 60-298848

Int. Cl.[5] B60K *31/04*

U.S. Cl. 364—426.04 **2 Claims**



1. A constant speed cruise control system for a vehicle comprising:

(a) a controller for automatic speed change for automatically changing over one of the speed stages in a transmission in accordance with a relationship between a throttle valve opening degree and a car speed; and

(b) a controller for constant speed traveling comprising:

(b1) a first means for calculating an output duty ratio D by the following equation:

$$D = G(VM - VS) + SD$$

where

G = gain

VM = target car speed

VS = actual car speed

SD = set duty ratio corresponding to the target car speed VM,

and for controlling a throttle valve according to the output duty ratio D;

(b2) a second means for supplying a signal for prohibiting selection of overdrive speed stage in the transmission to the controller for automatic speed change at a time when the car speed lowers by a first predetermined value A from the target car speed VM;

(b3) a third means for detecting that the car speed recovers up to the value (VM − B) where B is a second predetermined value smaller than the first value A, after the overdrive speed-stage-selection prohibiting signal is supplied from the second means;

(b4) a fourth means responsive to an output from the third means for supplying a signal for prohibiting selection of overdrive speed stage to the controller for automatic speed change throughout a predetermined period TOD after the car speed recovers up to the value (VM − B), and

(b5) a fifth means responsive to a signal for shifting down from the overdrive speed stage from the controller for automatic speed change, for enabling the fourth means to thereby prohibit selection of overdrive speed stage when D < SD regardless of controlling by the controller for automatic speed change, and for disabling the fourth means to thereby prevent the fourth means from prohibiting selection of overdrive speed stage when D > SD, wherein the controller for automatic speed

change thereby allows the transmission to selectively change over one of the speed stages.

4,984,167

CONTROL APPARATUS AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

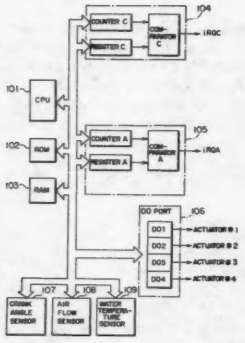
Matsuo Amano, Hitachi, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,699

Claims priority, application Japan, Feb. 5, 1988, 63-23694

Int. Cl.[5] F02M *51/00*; F02P *3/00*

U.S. Cl. 364—431.04 **15 Claims**



7. A control apparatus for controlling a plurality of actuators for an internal combustion engine, comprising:

a controller for calculating respective count values representing control timings in a sequence of control timings at which respective ones of said plurality of actuators are to be controlled;

storing means for storing said respective count values associated with different actuators as they are calculated by said controller along with information identifying an actuator associated with each count value; and

a number of compare register units, said number being less than the number of actuators to be controlled, each compare register unit having a counter connected to a pulse signal source for counting pulse signals, a compare register for holding a count value transferred from said storing means by said controller and a comparator connected to said counter and said compare register for outputting a control signal to said controller to cause said controller to control the actuator associated with the count value held in said compare register as identified by the information stored in said storing means and to transfer another count value from said storing means to a compare register in a compare register unit.

4,984,168

METHOD AND APPARATUS FOR DETERMINING A ROUTE BETWEEN A STARTING POINT AND A DESTINATION

Ernst-Peter Neukirchner, Hildesheim, and Dietmar Schlögl, Sibbesse, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

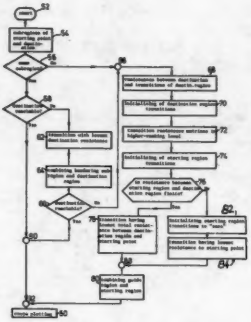
PCT No. PCT/DE88/00329, § 371 Date Aug. 24, 1989, § 102(e) Date Aug. 24, 1989, PCT Pub. No. WO88/09974, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 4, 1988, Ser. No. 307,088

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719017

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **15 Claims**



1. A method for determining a route between a starting point (S) and a destination or target (Z), which are located on a road map, and digitally stored in a read-only memory (14).

comprising the steps of

dividing the road map into at least two levels of different grid density and regional size;

storing the maps of said at least two levels in at least two levels (18, 20) of said memory;

assigning a plurality of smaller subregions of fine grid density to a lower one of said levels and assigning one or more larger subregions of coarser grid density to a higher one of said levels;

first analyzing the road maps with the lowest level to find a possible route between the starting point (S) and the destination (Z), and

if the results of such analysis are positive, plotting the route based on the memory within said level; or

if the results of said analysis are negative, so that no connecting route between the starting point (S) and the destination (Z) is found,

analyzing the road map stored in the memory of the next higher level;

determining when a positive result is obtained; and

then plotting the route based on the contents of the memories in said at least two levels.

4,984,169

DATA LOADING AND DISTRIBUTING PROCESS AND APPARATUS FOR CONTROL OF A PATTERNING PROCESS

Harold L. Johnson, Jr., Pauline, S.C., assignor to Milliken Research Corp.; Spartanburg, S.C.

Filed Mar. 23, 1989, Ser. No. 327,843

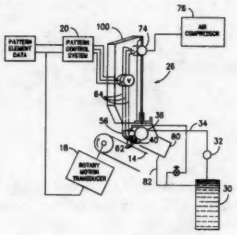
Int. Cl.[5] G06F *15/46*; D06B *1/02*

U.S. Cl. 364—469 **14 Claims**

1. A method for processing digitally encoded pattern information for use in a patterning method wherein a substrate to be patterned is moved on a path along which the surface of said

substrate comes into operative range of a first, upstream array and at least one successive, downstream array, each of said upstream and downstream arrays being comprised of a plurality of individual dye applicators, and wherein each of said individual dye applicators in each such array is capable, in accordance with said pattern information, of selectively projecting a stream of dye onto a predetermined portion of said substrate surface for a time period determined by said pattern information, said time period being referred to herein as dye contact time, and wherein all of said individual applicators in said respective array are capable of initiating simultaneously said selective projection of their respective dye streams whenever said predetermined portion of said substrate surface is passing within operative range of said applicators in said array, said processing method for said digitally encoded pattern information comprising:

a. generating, for each array, an individual dye contact time for each dye applicator in accordance with said pattern information;



b. arranging, for each array, each of said dye contact times in a sequence corresponding to the physical position of each applicator comprising said array;

c. for each such sequence of dye contact times intended for each downstream array, associating a delay which allows said predetermined portion of said substrate surface to become positioned within operative range of said applicators in said downstream array before said applicators comprising said downstream array initiate said selective dye stream projection onto said predetermined portion in accordance with said pattern information; and

d. allocating, for simultaneous transmission to each applicator comprising each respective array, the sequence of individual dye contact times specified by said pattern information for said predetermined portion of said substrate surface which is passing within operative range of said applicators at the time of said transmission.

4,984,170

AUTOMATIC TICKET VENDING MACHINE

Kazuaki Hirahara, Ibaraki, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 21, 1988, Ser. No. 287,333

Claims priority, application Japan, Dec. 28, 1987, 62-333091

Int. Cl.[5] G07B *15/02*

U.S. Cl. 364—464.01 **4 Claims**

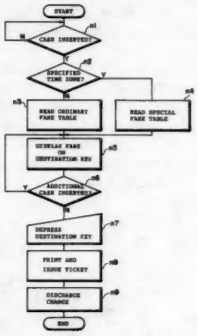
1. An automatic ticket vending machine, comprising:

(a) memory means for storing a first fee and a second fee different from said first fee;

(b) calendar means for storing a specified day and time;

(c) clock means for measuring a day and time; and

(d) ticket issuing means for issuing tickets at said first fee when said day and time output from said clock means match said specified day and time stored in said calendar means and at said second fee when said day and time



output from said clock means do not match said specified day and time stored in said calendar means.

4,984,171

CONTROL METHOD AND APPARATUS FOR AUTOMATIC WELDING MACHINE

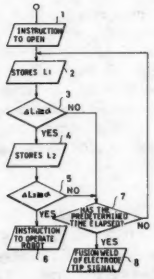
Gen Tsujii, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 313,000

Claims priority, application Japan, Feb. 23, 1988, 63-38534

Int. Cl.[5] G06F *15/46;* **B23K** *9/12;* **B25J** *11/00*

U.S. Cl. 364—477 **2 Claims**



1. A control method for an automatic welding machine in which a welding gun is moved by a robot successively to a plurality of welding spots on a workpiece in order to carry out spot welding, said control method comprising the steps of:

detecting by a pair of distance sensors the respective movements of a pair of gun arms of the welding gun;

determining from changes in outputs of the respective distance sensors at the time when the welding gun is being opened after completion of the welding at each welding spot whether or not each gun arm has started to move toward its opening side; and

operating the robot when it is confirmed that the gun arms have both started moving toward their opening sides.

4,984,172

SYSTEM FOR DETECTING AND CORRECTING DEFECTS IN ARTICLES BEING PROCESSED, IN PARTICULAR WOOD PANELS WITH SPLITS, KNOT-HOLES, ETC.

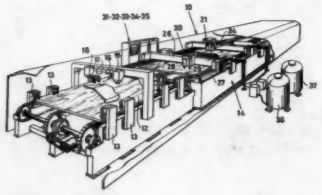
Massimo Luminari, Lesmo, Italy, assignor to Lorenzo Cremona, Milano, Italy

Continuation of Ser. No. 407,682, Sep. 14, 1989, abandoned, which is a continuation of Ser. No. 199,352, May 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 19,610, Feb. 27, 1987, abandoned. This application May 21, 1990, Ser. No. 526,695

Claims priority, application Italy, Mar. 21, 1986, 19823 A/86

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—478 **3 Claims**



1. In an apparatus for detecting and correcting defects in plywood panels including conveyor means for translating the panels along a path in the X direction, defect detection means for scanning the surface of the panels to locate defects therein, correcting means downstream of the detection means for removing portions of said panel corresponding to the detected defects and for patching the removed portions with a flowable plugging material as the panel moves along said path and control means operatively connected between the detection means and the correcting means for operating the correcting means to correct the defects, wherein the improvement comprises at least one defect detection and measuring device for measuring the length, width and depth of the defects in the panels in the X, Y and Z axes respectively, said detection and measuring device comprising means for projecting a light beam transversely onto the surface of the panels and means for receiving the reflected beam at a given angle with respect to the axis of projection and for resolving the said reflected beam into a series of points, said receiving means measuring the position of each point with respect to the X, Y and Z axes and the ratio between its light intensity and the mean of the light intensity of all points of the reflected beam to thereby determine the length, width and depth of each defect.

4,984,173

SYSTEM FOR ALIGNING A ROTATING LINE-SHAFT

Imdad Imam, Schenectady, N.Y., and Gerald J. Carlson, Greenfield Township, Milwaukee County, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1989, Ser. No. 363,841

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—508 **12 Claims**

10. A method for determining the magnitude of static displacement of a rotating shaft from an aligned reference position at each respective one of a plurality of bearings supporting said shaft, said shaft tending to vibrate due to said static displacement at at least one of said bearings, said method comprising:

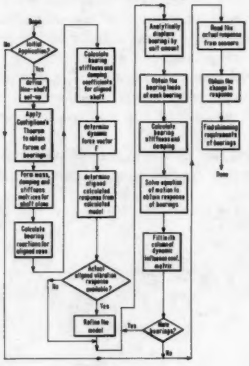
determining the linear vibration displacement value of each bearing for the aligned shaft-bearing system;

creating a matrix of dynamic influence coefficient values for a misaligned shaft-bearing system wherein each bearing is misaligned a unit displacement value, said matrix of values being calculated from said unit displacement values which correspond to a set of calculated vibration response values based on the unit displacement values;

measuring the actual linear dynamic vibration displacement value of each bearing;

determining the linear static displacement value for each said bearings from (1) the measured linear dynamic displacement values; (2) the determined vibration displacement value of an aligned system; and (3) the created matrix of dynamic influence coefficient values; and

shimming each said bearing in accordance with the magnitude of said static displacement of each said bearing, an amount of shimming for each respective bearing being substantially equal to and opposite from said static displacement at each respective bearing.



4,984,174

INFORMATION SERVICE SYSTEM

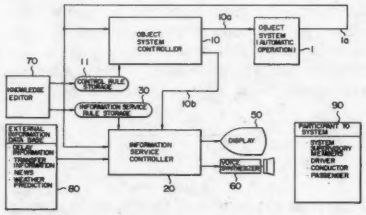
Seiji Yasunobu, Yokohama, and Kuniaki Matsumoto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,066

Claims priority, application Japan, Nov. 11, 1987, 62-283280

Int. Cl.[5] G06F *15/18*

U.S. Cl. 364—513 **17 Claims**



1. An information service system which supplies a predetermined information to a participant using an object system, comprising:

control rule storage means for transforming intellectual activities regarding control rules for said object system into a first algorithmic form for storage as a control knowledge base;

object system control means connected to said object system and said control rule storage means, for detecting a present condition of said object system, calculating with said condition in dependence upon said control knowledge

base and controlling said object system in accordance with result of the calculation;

information service rule storage means for transforming intellectual activities regarding information services to said participant into a second algorithmic form for storage as information knowledge base;

information storage means for storing as an information data base internal information regarding said object system and external information including news or weather predictions;

information service control means connected to said object system, said object system control means, said information service rule storage means and said information storage means, for detecting the condition of said object system and control condition of said object system control means, for calculating with said conditions in dependence upon said information knowledge base, for selecting a most suitable information for said participant from said information storage means in accordance with result of the calculation, and for outputting said most suitable information; and

information display means for notifying said system participant of information corresponding to said most suitable information from said information service control means.

4,984,175

METHOD OF DIRECTLY TEACHING A HORIZONTAL ARM TYPE MULTI-ARTICULATED ROBOT AND AN APPARATUS FOR CARRYING OUT SAME

Kenichi Toyoda, Hino; Nobutoshi Torii, Hachioji; Ryo Nihei, and Akihiro Terada, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

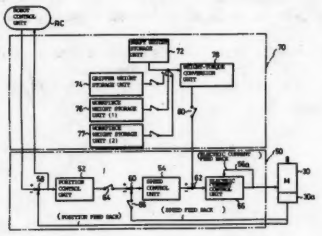
PCT No. PCT/JP88/00610, § 371 Date Feb. 10, 1989, § 102(e) Date Feb. 10, 1989, PCT Pub. No. WO88/10178, PCT Pub. Date Dec. 29, 1988

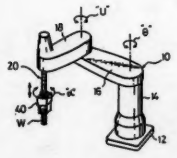
PCT Filed Jun. 20, 1988, Ser. No. 347,965

Claims priority, application Japan, Jun. 19, 1987, 62-151421

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—513 **6 Claims**





1. A method of direct teaching by an operator of a motion command to a motor-driven vertically movable shaft, which is arranged at the extremity of a horizontal articulated arm assembly of a multi-articulated robot, and is operated by a programmed command issued from a robot control unit, comprising the steps of:

storing values corresponding to a weight of said vertically movable shaft and a variable weight applied to a lower end of said vertically movable shaft;

disconnecting a signal line extending from said robot control unit to an electric current control circuit of a motor control unit for controlling a motor for driving said vertically movable shaft when starting a teaching operation by said operator;

connecting a signal line extending from a torque calculating circuit for deciding a load torque corresponding to a sum of the stored values of the weight of said vertically movable shaft and the variable weight applied to a lower end of said vertically movable shaft to said electric current control unit of said motor control unit for controlling a motor for driving said vertically movable shaft to thereby preliminarily compensate said load torque applied to said vertically movable shaft with a drive torque exerted by said motor; and,

moving said vertically movable shaft up and down by a manual operation of said operator to thereby directly teach a desired motion to said shaft while substantially no load is imposed on said operator.

4,984,176

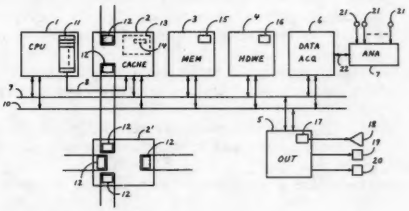
VDH BIOCOMPUTER

Raymond C. Van den Heuvel, 18618 Celtic St., Northridge, Calif. 91326

Filed Jan. 11, 1988, Ser. No. 142,063

Int. Cl.[5] G06F *15/18*

U.S. Cl. 364—513 **2 Claims**



1. A method for programming a computer for enhancing said computer's ability to perform heuristic searches and other "intellingent" tasks, said method comprising the steps of

Grouping associated data, algorithmic and processing information in a code sequence called a SEGMENT;

Assigning a unique NAME to each SEGMENT;

Including in each NAME a PREFIX that indicates whether said each NAME will be copied from one end of a dual-entry stack to the other, or wheter it shall be replaced by other NAMES included in its DEFINITION on the same side of said dual-entry stack prior to being "called" or "execute, " and whether or not said DEFINITION contains OPTIONAL (additional) INSTRUCTIONS;

Completing the abovementioned DEFINITION of each SEGMENT by writing in their proper place the following items:

a START FLAG;

an ENGLISH NAME;

a MACHINE NAME;

the NUMBER OF BYTES of code;

OPTIONAL (additional) INSTRUCTIONS;

a main body of said SEGMENT, consisting of either machine or "intelligent" code, the latter consisting of a sequence of NAMES as above;

an END (or RETURN) FLAG; and

Involving during normal program execution the use of a special DISPATCHER calling routine, said DISPATCHER automatically copying said NAMES or their

DEFINITIONS on one side or the other of abovementioned dual-entry stack depending on their PREFIXES.

4,984,177

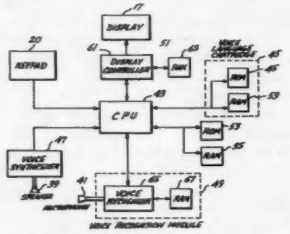
VOICE LANGUAGE TRANSLATOR

Stephen A. Rondel, Redmond, and Joel R. Carter, Mukilteo, both of Wash., assignors to Advanced Products and Technologies, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 152,903, Feb. 5, 1988, abandoned. This application Feb. 1, 1989, Ser. No. 306,001

Int. Cl.[5] G10L *5/00*

U.S. Cl. 364—513.5 24 Claims



1. A speech translator for translating words spoken by a user in a first language into spoken words in a second language, said speech translator comprising:

language storing means for storing, in digitally coded form, voice patterns of words and phrases in first and second languages, at least some of said digitally coded voice patterns being stored in banks of related words and phrases;

word recognition means for receiving audible words spoken by a user and creating corresponding voice patterns in digitally coded form;

word producing means for receiving voice patterns in digitally coded form and creating corresponding audible words; and

programmable control means connected to said language storage means, said word recognition means and said word producing means for translating words spoken by a user in said first language into spoken words in said second language by controlling the operation of said language storage means, said word recognition means and said word producing means, said programmable control means including a training mode of operation and a translate mode of operation, said training mode of operation training said speech translator to understand words spoken by a user in said first language by: (i) instructing a user to speak a series of words in said first language stored in digitally coded fc rm in said language storage means; and (ii) storing the digitally coded voice patterns produced by said word recognition means in response to said user speaking said series of words in said first language as a series of trained voice patterns, said translate mode of operation translating words spoken by said user in said first language into said second language by: (i) comparing the digitally coded voice patterns, produced by said word recognition means when said user speaks words in said first language, with said stored series of trained voice patterns (ii) using the results of said comparison to locate digitally coded voice patterns of corresponding words in said second language stored in said language storing means; and (iii) applying said digitally coded voice patterns of said corresponding words to said word producing means, said programmable control means only accessing selected ones of said banks of related words and phrases stored in said language storing means in a logical sequence when comparing the digitally coded voice patterns produced by said word recognition means when said user speaks words in said first language with said stored series of trained voice patterns.

4,984,178

CHART PARSER FOR STOCHASTIC UNIFICATION GRAMMAR

Charles T. Hemphill, Coppell, and Joseph W. Picone, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 21, 1989, Ser. No. 312,835

Int. Cl.[5] G10L *9/00*

U.S. Cl. 364—513.5 33 Claims

1. A method for recognizing a spoken input representing a plurality of words, comprising the steps of:

(a) inputting a desired spoken input composed of a plurality of grammar levels;

(b) inputting grammars having terminal and non-terminal symbols for defining allowable sentence structures;

(c) inputting a lexicon having entries for defining terminal symbols of the grammar in terms of linguistic, syntactic or semantic features;

(d) generating a matrix of state sets;

(e) initializing said state sets;

(f) reading said desired spoken input;

(g) predicting initial and final probabilities for a current frame for each start symbol of grammar;

(h) parsing said start symbols according to said spoken input and grammars to produce observations of said symbols based on delayed commitment calculation of said predicting step; and

(i) explaining said spoken input based on the observations of said step of parsing.

4,984,179

METHOD AND APPARATUS FOR THE PERCEPTION OF COMPUTER-GENERATED IMAGERY

Jonathan D. Waldern, Melton Mowbray, United Kingdom, assignor to W. Industries Limited, Leicester, United Kingdom

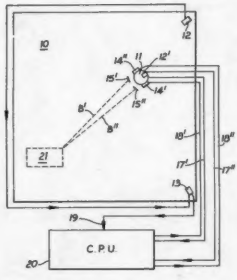
Division of Ser. No. 144,090, Jan. 15, 1988, Pat. No. 4,884,219. This application Sep. 7, 1989, Ser. No. 404,101

Claims priority, application United Kingdom, Jan. 21, 1987, 8701288

The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[5] G06F *15/62, 15/20;* G06K *15/00*

U.S. Cl. 364—514 8 Claims



1. A method for presenting different computer-generated images of an object to respective eyes of a person viewing said object whereby said object is perceived stereoscopically, the method comprising:

locating in a fixed relation to each eye of said person means to project a different image of said object into said eye,

monitoring a line of sight of each said eye and an angle of convergence of said lines of sight,

computer-generating two different images of said object as viewed by said eyes at the same spatial coordinates relative to said person, and

modifying each image according to variations in the relationship between said spatial coordinates and said angle of convergence.

4,984,180

METHOD FOR COMPUTER AIDED GENERATOR OF DESIGN REFERENCE AND APPARATUS THEREFOR

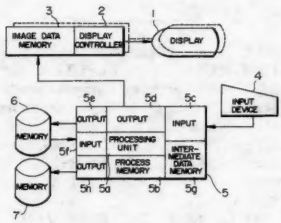
Yutaka Wada, Hitachi; Yasuhiro Kobayashi, Katsuta, and Toru Mitsuta, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 916,728, Oct. 8, 1986, abandoned. This application Nov. 22, 1989, Ser. No. 440,442

Claims priority, application Japan, Oct. 9, 1985, 60-223570

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—518 **18 Claims**



9. A design reference generating apparatus comprising:

an input device;

a display device;

first memory means for storing data of design objects;

second memory means for storing a procedure for supplying to said display device graphic information of design objects designated by said input device for display of said graphic information on said display device, selecting specification data from said memory device by using a redesignated design object for display of said specification data on said display device, selecting restrictive items from said memory device using said redesignated design object for display of said restrictive items as a plurality of menus of restrictive items on said display device, said restrictive items being parameters of said redesignated design object, selecting particular specification data by using a selection signal from said input means, selecting a particular restriction item using a selection signal from said input means, and setting a reference value corresponding to said selected particular restrictive item; and

processing means for outputting graphic information of said redesignated design object based on said procedure stored in said second memory means and for creating said design reference consisting of condition and conclusion parts;

said display means displaying the graphic information of said redesignated design object and said design reference.

4,984,181

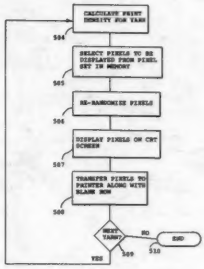
METHOD OF SIMULATING BY COMPUTER THE APPEARANCE PROPERTIES OF A FABRIC

Harvey L. Kliman, Chadds Ford, Pa., and Royden H. Pike, Claymont, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 874,476, Jun. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 724,599, Apr. 18, 1985, abandoned. This application Nov. 18, 1988, Ser. No. 273,068

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—518 **3 Claims**



1. A computer-aided method of simulating and displaying wanted or unwanted gray scale patterning independent of color due to variation in physical or chemical properties of a yarn used for knitting a warp knot fabric, said fabric having a stitch pattern with courses and wales and each of said yarn properties having a constant factor, said method comprising the steps of:

selecting a data set of at least one yarn physical property and the contrast factor for said yarn physical property for each yarn in the warp knit fabric;

providing a computer with a data base that includes the yarn physical property and the contrast factor for said yarn physical property for each yarn in the warp knit fabric;

averaging said yarn physical property according to said stitch pattern to produce a wale average property for each wale in said fabric;

calculating print density from said wale average properties and said contrast factor; and

displaying said print density as a display element to represent each wale in said warp knit fabric whereby a simulation of the fabric appearance made from said yarns is obtained by knowing said yarn physical property and said contrast factor for each yarn in the warp knit fabric.

4,984,182

LASER PRINTER CONTROLLER FLEXIBLE FRAME BUFFER ACHITECTURE WHICH ALLOWS SOFTWARE TO INITIATE THE LOADING OF A FRAME BUFFER START ADDRESS

Hershow Chang, Los Altos; Seong Kim, Saratoga, and Tetsuro Motoyama, San Jose, all of Calif., assignors to Ricoh Company, Ltd., Japan and Ricoh Corporation, San Jose

Continuation of Ser. No. 379,018, Jul. 12, 1989, Pat. No. 4,984,182. This application Jun. 25, 1990, Ser. No. 543,167

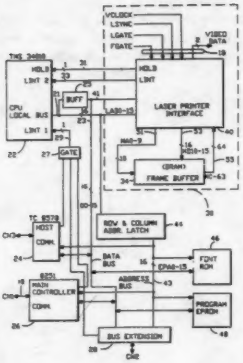
Int. Cl.[5] G06K *15/00*

U.S. Cl. 364—519 **18 Claims**

18. In a raster output controller system including a raster output device for printing characters, graphics or images on various size documents wherein said documents include first docuemnts having a first size and second documents having a second, different size, a controller comprising

means for controlling said raster output device,

a linearly variable frame buffer for receiving input digital data representative of a first number of scan lines and a second number representative of the number of pixels (dots) per scan line, and



control means for linearly changing said first or second numbers, depending upon the size of the first or second documents to be printed by said output device, said control means including a first register and means for loading the frame buffer start address for any predetermined location in said first register.

4,984,183

GRAPHICS DISPLAY CONTROLLER FOR TRANSFERRING FIGURE DATA TO OVERLAPPING PORTIONS OF DESTINATION AREA AND DRAWING-ENABLE AREA DEFINED BY CLIPPING RECTANGLE

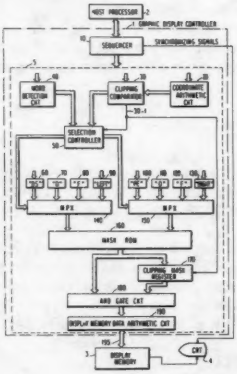
Mitsurou Ohuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,148

Claims priority, application Japan, Feb. 13, 1987, 62-31023

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—521 **7 Claims**



1. A graphics display controller having a function of transferring figure data to a destination area including a portion contained in a drawing-enable area defined by a clipping rectangle having a diagonal line defined by first and second coordinate data, said controller comprising means for storing third coordinate data relative to said first coordinate data and fourth coordinate data relative to said second coordinate data, means for comparing coordinate data designating respective ones of words constituting said destination area with said third and fourth coordinate data to produce a comparison result which takes first data representing a first state in which the designated word is inside said drawing-enable area, or a second data representing a second state in which the designated word is outside said drawing-enable area, or third data representing a third state in which the designated word contains a boundary of said drawing-enable area, means responsive to said comparison result from said comparing means and to information representative of said boundary of said drawing-enable area for generating first information which designates all the bits of said designated word when said comparison result takes said first data, no bit of said designated word when said comparison result takes said second data and bits or bits of said designated word contained in said drawing-enable area when said comparison result takes said third data, means responsive to a position of said designated word and to information representative of a boundary of said destination area for generating second information which designates all the bits of said designated word when said designated word does not contain said boundary of said destination area and bit or bits of said designated word contained in said destination area when said designated word contains said boundary of said destination area, and means coupled to said first information generating means and said second information generating means for writing the figure data simultaneously into the bit or bits designated by both of said first and second information in each word of said destination area.

4,984,184

CONTROLLING DEVICE FOR ELECTRIC APPARATUS

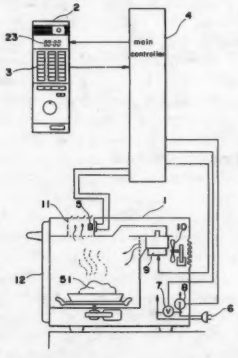
Hitoshi Kurita, Yamato koriyama; Hiroyuki Senda, Nara, and Hiroshi Terasaki, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 215,803, Jul. 6, 1988, abandoned. This application May 17, 1990, Ser. No. 525,222

Claims priority, application Japan, Jul. 6, 1987, 62-168058; Apr. 28, 1988, 63-106438

Int. Cl.[5] G06F *15/20*; G05B *11/01*

U.S. Cl. 364—551.01 **5 Claims**



1. A control apparatus for an electric appliance which is operated with a plurality of functions each of which is operated independently of each other, comprising:

a load used for a plurality of functions;

a relaying means for selectively connecting a power supply to said load;

a monitor means connected to said load for monitoring an operating condition of said load;

an input means for inputting a setting of an operation of said load to the electric appliance;

a display means for displaying an operation of said input means and for displaying any abnormalities detected by said monitor means; and

a major controlling means connected to said relaying means, monitor means, input means and display means, for performing a given controlling operation with respect to said monitor means and inputs set in the electric appliance, wherein, when an abnormality in said load has been detected by said monitor means, and when said power supply is disconnected from said load by said relaying means, and when said display of said detected abnormality is removed by a given operation of said input means, and when an operation mode which includes a portion of said detected abnormality is selected by said input means, said abnormality is displayed again on the display means and the operation of the operation mode is prohibited.

4,984,185

PORTABLE COMPUTER HAVING A BATTERY VOLTAGE DETECTING CIRCUIT

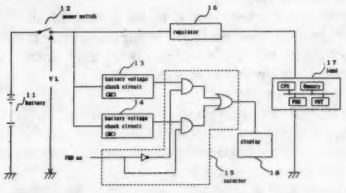
Yuichi Saito, Ome, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 368,957, Jun. 13, 1989, abandoned, which is a continuation of Ser. No. 116,799, Nov. 5, 1987, abandoned. This application May 30, 1990, Ser. No. 530,458

Claims priority, application Japan, Nov. 7, 1986, 61-171030[U]

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—707 **7 Claims**



1. A system for detecting the condition of a battery power source of a battery powered apparatus having a first type of component operative when energized to draw a first current value, and a second type of component operative when energized to draw a second current value substantially greater than the first current value, said system comprising:

first circuit checking means responsive to the drawing of a current value corresponding to the first current value for generating a first output signal at times when the battery voltage is less than a first predetermined reference voltage;

second circuit checking means responsive to the drawing of a current value corresponding to the second current value for generating a second output signal at times when the battery voltage is less than a second predetermined reference voltage substantially lower than the first reference voltage;

display means responsive to a selected one of the first and second output signals for indicating the condition of the battery power source; and

selecting means governed by a load value corresponding to the electrical load across the battery power source for selecting one of the first and second output signals.

4,984,186

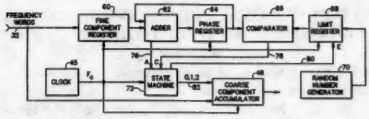
PHASE ACCUMULATOR WITH DITHERED INCREMENTING OF ACCUMULATION DUE TO FINE PHASE COMPONENTS

Karl E. Moerder, Poway, Calif., assignor to Titan Linkabit Corporation, San Diego, Calif.

Filed Aug. 25, 1989, Ser. No. 398,703

Int. Cl.[5] G06F *1/02*

U.S. Cl. 364—721 **3 Claims**



1. A phase accumulator for accumulating digital frequency words, which, as accumulated, represent the phase of a cyclic waveform of a predetermined frequency, comprising

a coarse-component accumulator for accumulating coarse phase components of the digital frequency words;

a fine-component accumulator for accumulating fine phase components of the digital frequency words; and

means for incrementing the coarse-component accumulator in response to accumulation of the fine phase components;

wherein said incrementing means comprise

means for providing a variable randomly generated value for each fine-component accumulation cycle;

means for periodically sampling the accumulation of the fine phase components in relation to the randomly generated value; and

means for incrementing the coarse component register for each fine-component accumulation cycle, with the phase of said incrementing being dithered in accordance with the number of times the accumulated fine phase components exceed the randomly generated values during the sampling period.

4,984,187

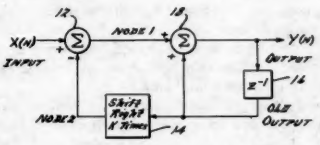
FIRST ORDER RECURSIVE DIGITAL FILTER WITHOUT MULTIPLIER

Mark Graybill, Moorpark, and Allan Goetz, Reseda, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 24, 1985, Ser. No. 813,180

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—724.17 **10 Claims**



1. A recursive digital filter for filtering an N-bit digital input signal to generate a filtered output signal, said filter comprising:

a first binary adder having a first input and first output, said first input for receiving said N-bit digital input signal said first binary adder generating a first output signal which is provided at said first output;

a second binary adder having a first input coupled to said first output of said first binary adder said second binary adder having a first output; and

means for providing feedback to said first and second binary

adders, said means for providing feedback having a third input coupled to said first output of said second binary adder and generating a first feedback signal which is provided to a second input of said first binary adder and generating a second feedback signal which is provided to a second input of said second binary adder for generating said filtered output signal at said first output of said second binary adder.

4,984,188

DIGITAL SIGNAL PROCESSING DEVICE FOR CALCULATING REAL AND IMAGINARY PARTS OF AN INPUT SIGNAL

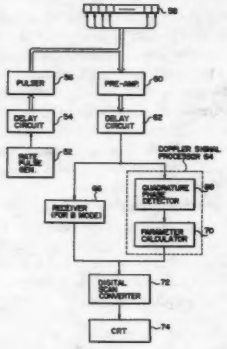
Haruo Kato, Kuroiso, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 130,645, Dec. 9, 1987, abandoned. This application Jun. 6, 1989, Ser. No. 363,395

Claims priority, application Japan, Dec. 11, 1986, 61-293433; Dec. 15, 1986, 61-296566

Int. Cl.[5] G06F *7/38, 15/00*

U.S. Cl. 364—725 **6 Claims**



1. An ultrasonic diagnostic apparatus comprising:

transducer means including an array of ultrasonic transducer elements;

drive means for scanning said ultrasonic transducer elements so as to radiate an ultrasonic pulse to an object of diagnosis;

receiver means for receiving the ultrasonic pulse radiated from said transducer means and reflected by the object of diagnosis and for outputting a digital received signal based on the pulse received;

phase-detecting means for detecting a phase of the digital received signal from said receiver means, said phase-detecting means comprising

imaginary part calculating means for Hilbert-transforming the digital received signal and outputting a Hilbert-transformed signal as an imaginary part signal wherein said imaginary part calculating means is a Hilbert-filter means having a frequency characteristic of a transfer function H(107) which is,

$$H(\omega) = 2j \sum_{n=1}^{(N-1)/2} h(n)\sin n\omega$$

if N is an odd number, and

$$H(\omega) = 2j \sum_{n=0}^{(N/2)-1} h(n)\sin(n = \tfrac{1}{2})\omega$$

if N is an even number, where

h(n) denotes a Hilbert-band-pass filter coefficient and,

if N is an odd number,

a coefficient corresponding to an output of an (N−1)/2-th latch circuit counted from an input end side is h(0), and a coefficient corresponding to an output of an ((N−1)/2)+1-th latch circuit counted from the input end side is ± (l) and,

if N is an even number,

a coefficient corresponding to an output of an (N/2)±1-th latch circuit counted from the input end side is ±h(0), and a coefficient corresponding to an output of an (N/2)±(1=l)-th latch circuit counted from the input end side is ±h(∂), and

real part calculating means for delaying the digital received signal for a given time period which corresponds to a period of time from when the digital received signal is input to said imaginary part calculating means until the Hilbert-transformed signal is output from said imaginary part calculating means, and for outputting a delayed signal as a real part signal;

wherein a transfer function B(ω) of said real part calculating means is,

$$B(\omega) = b(0) + 2 \sum_{n=1}^{(N-1)/2} b(n)\cos n\omega$$

if N is an odd number, and

$$B(\omega) = 2 \sum_{N=0}^{(n/2)-1} b(n)\cos(n + (\tfrac{1}{2})\omega)$$

if N is an even number, where b(n) denotes a band-pass filter coefficient and,

if N is an odd number,

a coefficient corresponding to an output of an (−1)/2-th latch circuit counted from the input end side is b(0), and a coefficient of an ((N−1)/2+l)-th latch circuit counted from the input end side is b(l), and

if N is an odd number,

a coefficient corresponding to an output of an (N/2)+1-th latch circuit counted from the input end side is b(0), and a coefficient corresponding to an output of an (N/2)+(1l)-th latch circuit is b(l); and

phase calculating means for calculating an arctangent of a division which is obtained by dividing the imaginary part signal by the real part signal, and for outputting the arctangent as a phase of the digital received signal which indicates a speed and a direction of flow of the object; and

display means for displaying the speed and the direction of the flow of the object on the basis of the phase detected by said phase-detecting means.

4,984,189

DIGITAL DATA PROCESSING CIRCUIT EQUIPPED WITH FULL BIT STRING REVERSE CONTROL CIRCUIT AND SHIFTER TO PERFORM FULL OR PARTIAL BIT STRING REVERSE OPERATION AND DATA SHIFT OPERATION

Katsuhiko Neki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 3, 1986, Ser. No. 847,415

Claims priority, application Japan, Apr. 3, 1985, 60-70230

Int. Cl.[5] G11C *19/00*; G06F *5/00, 15/332*

U.S. Cl. 364—900 **4 Claims**

1. A data processing circuit having a set of data input terminals supplied with input data consisting of a string of bits and a set of data output terminals from which output data is derived, said data processing circuit comprising:

a reverse control circuit, including:

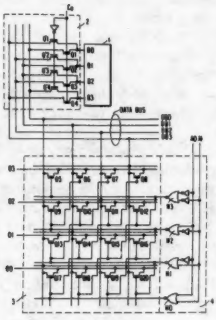
a set of input nodes each coupled to a corresponding one of said data input terminals;

a set of output nodes for outputting reverse control circuit output data; and

a control node supplied with a control signal which is variable between a first logic level and a second logic level, said reverse control circuit reversing a full bit string of said input data and outputting reversed data accordingly to said output nodes as said reverse control circuit output data in response to said first logic level of said control signal, and said reverse control circuit outputting said input data to said output nodes as said reverse control circuit output data without reversing any order of said bits of said input data in response to said second logic level of said control signal;

said data processing circuit further comprising a shift circuit, including:

a set of input nodes each coupled to a corresponding one of said output nodes of said reverse control circuit to receive said reverse control circuit output data;



a set of output nodes each coupled to a corresponding one of said data output terminals; and

a set of control nodes supplied with control data representative of shift value, said shift circuit shifting said reverse control circuit output data by said shift value represented by said control data and outputting shifted data accordingly to said output nodes of said shift circuit and hence to said data output terminal;

said data processing circuit reversing a full or partial bit string of said input data and producing output data having information representative of the reversed bit string of said input data in response to said first logic level of said control signal, a number of bits of said partial bit string of said input data being determined by said shift value represented by said control data, and

said data processing circuit shifting said input data by said shift value represented by said control data and producing output data having information representative of the shifted input data.

4,984,190

SERIAL DATA TRANSFER SYSTEM

Shigetatsu Katori; Yukio Maehashi, and Yukari Misawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 426,487, Oct. 23, 1989, abandoned, which is a continuation of Ser. No. 91,801, Sep. 1, 1987, abandoned. This application Aug. 20, 1990, Ser. No. 569,539

Claims priority, application Japan, Sep. 1, 1986, 61-206404; Sep. 10, 1986, 61-214432

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—900 **17 Claims**

1. A serial data transfer system comprising:

a first serial data processor acting as a master;

a second serial data processor acting as a slave;

a data line connecting said first and second serial data processors for allowing serial data to be transferred therethrough between said first and second serial data processors; and

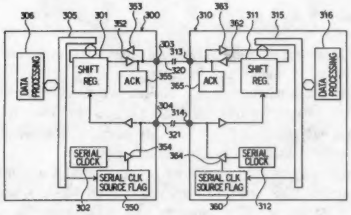
a clock line connecting said first and second serial data processors, wherein each of said first and second serial data processors includes:

serial clock generating means for outputting a serial clock onto said clock line so that said serial clock is transferred through said clock line between said first and second serial data processors;

reception confirmation signal output means including an acknowledge trigger flag for outputting a reception confirmation signal to said data line in response to a clock signal when said acknowledge trigger flag is set to a predetermined condition;

reception confirmation signal detection means including a reception confirmation signal detection flag for detecting said reception confirmation signal on said data line so as to set said reception confirmation signal detection flag to a predetermined condition;

serial clock control means coupled to receive said clock line to detect completion of transfer of a predetermined number of serial clock signals in order to detect completion of transfer of data composed of a predetermined number of bits,



whereby said serial clock control means of said first serial data processor responds to said detection of said completion of transfer of data to generate a reception confirmation signal sampling signal to send to said serial clock generating means and said reception confirmation signal detection means of said first serial data processor so that said serial clock generating means of said first serial data processor will successively generate said serial clock and output said serial clock to said second data processor until said reception confirmation signal detection flag is set, and at the same time said reception confirmation signal detection means of said first serial data processor starts an operation for detecting said reception confirmation signal on said data line; and

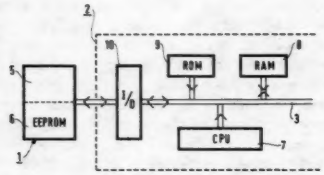
said acknowledge trigger flag of said reception confirmation signal output means in said second serial data processor is set to said predetermined condition in response to completion of processing of said data composed of said predetermined number of bits received by said second data processor so that said reception confirmation signal output means of said second serial data processor outputs said reception confirmation signal in synchronism with said serial clock received after said processings for said received data such that said reception confirmation signal detection means detects said reception confirmation signal and sets said reception confirmation signal detection flag so that said serial clock generating means stops generation of said serial clock in response to the reception confirmation signal detection flag being set.

4,984,191

LIMITED WRITE NON-VOLATILE MEMORY AND A FRANKING MACHINE MAKING USE THEREOF

Bernard Vermesse, L'Hay les Roses, France, assignor to SMH Alcatel, Paris, France

Filed Mar. 29, 1988, Ser. No. 174,759
Claims priority, application France, Mar. 31, 1987, 87 04478
Int. Cl.[5] G07B *17/00*
U.S. Cl. 364—900 18 Claims



4. A franking machine including means that generate successive overall values of the franking operations performed, said franking machine including a limited-write non-volatile memory system for recording successive data sets each comprises m bits, and each having the possibility of being renewed R times the memory system comprising:

a memory device which can be addressed for a maximum number E of times for written at each address, said memory having a limited memory space attributed to said data sets and defining a capacity which is less than the capacity required for renewing said data sets R times;

said limited memory space being organized as a first zone for recording n of the m bits in each data set at first fixed addresses in said first zone, said n bits requiring renewing fewer than E times, and a second zone for recording the remaining m–n bits in each data set at variable system addresses within said second zone, together with at least one of the n bits of the set under consideration, referred to as a redundancy bit; and

said memory system further including a programmed circuit for processing and controlling the addressing of said limited memory space, said circuit causing said first fixed addresses to be designated for recording said n bits in the plate of the preceding n bits only on occasions that said n bits are altered; causing a second, variable address to be designated for recording said m–n bits together with at least one associated redundancy bit on each occasion that a new data set is to be recorded, said designated second address being the next second address in a closed loop sequence including all to said second addresses; and also counting the number of successive loops completed through said sequence of said variable second addresses, thereby constituting a wear meter,

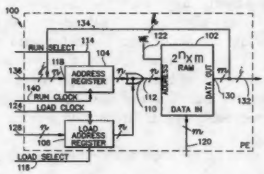
wherein said limited memory space constitutes the up meter memory of the franking machine, for which the successive total values of the franking operations performed constitute said successive data sets, and in which said programmed circuit include means for locking said machine when said wear meter reaches the maximum number E of writes.

4,984,192

PROGRAMMABLE STATE MACHINES CONNECTABLE IN A RECONFIGURATION SWITCHING NETWORK FOR PERFORMING REAL-TIME DATA PROCESSING

Jeffrey C. Flynn, Irvine, Calif., assignor to Ultrasystems Defense Inc., Irvine, Calif.

Filed Dec. 2, 1988, Ser. No. 279,440
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—900 13 Claims



1. A programmable element to provide a programmable state machine, comprising:

a run address register having a set of run address register inputs, a set of run address register outputs and a clock input, said run address register responsive to a clock signal on said clock input to transfer data from said set of run address register inputs to said set of run address register outputs;

a random access read/write memory (RAM) having a set of RAM address inputs, a set of RAM data inputs and a set of RAM data outputs, said RAM responsive to an address on said set of RAM address inputs to provide a plurality of RAM data bits on said set of RAM data outputs stored at a location address defined by said address;

a selector that connects said set of run address register outputs to said set of RAM address inputs;

at least one programmable element input line from a source to at least one external to said programmable element input of said set of run address register inputs to provide an external data input to said run address register;

at least one internal programmable element feedback line from said set of RAM data outputs to at least one input of said set of run address register inputs to provide at least one bit of said plurality of RAM data bits on said set of RAM data outputs as an input bit to one of said run address register inputs; and

at least one programmable element output line from one output of said set of RAM data outputs to provide an external connection to at least one output of said set of RAM data outputs.

4,984,193

MEMORY CARTRIDGE

Katsuya Nakagawa, Kyoto, Japan, assignor to Nintendo Co., Ltd., Japan

Continuation of Ser. No. 47,039, May 5, 1987, Pat. No. 4,926,372. This application Dec. 29, 1989, Ser. No. 459,323
Claims priority, application Japan, May 6, 1986, 61-104175
Int. Cl.[5] G06F *12/06, 15/44*
U.S. Cl. 364—900 18 Claims

1. A memory cartridge attachable to and detachable from a main unit including a computer, said main unit having a data bus, an address bus and a central processing unit, said memory cartridge comprising:

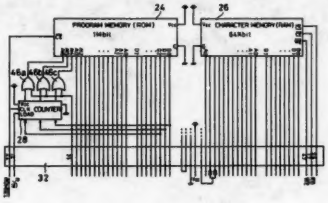
a circuit board having address lines and data lines attachable to said address bus and said data bus, respectively, when said cartridge is attached to said main unit;

a first memory mounted on said circuit board, said first memory being non-volatile and having address terminals connected to said address lines and data terminals connected to said data lines, said first memory having a predetermined storage capacity and being divided into a plural-

ity of banks, each of said banks having a plurality of address locations, at least one of said banks storing bank selecting data for selecting other of said banks;

data holding means mounted on said circuit board for holding bank selecting data, said data holding means having at least one data input terminal connected to at least one of said data lines, and having at least one output terminal; and

conductive pattern means formed on said circuit board and connecting said at least one output terminal of said data holding means to a predetermined portion of said address terminals of said first memory; wherein



said data holding means is loaded with bank selecting data that is read from said first memory in response to an enable signal for enabling said first memory and a read/write signal for accessing said first memory means both of which are received from said central processing unit, and said first memory includes means for reading out data stored in an address location that is addressed by said central processing unit in a bank that is selected by said bank selecting data that has been previously loaded into said data holding means.

4,984,194

METHOD AND APPARATUS FOR TRANSFERRING DATA BETWEEN TWO DATA PROCESSING EQUIPMENTS EACH DRIVEN BY AN INDEPENDENT CLOCK

Bertil G. Högberg, Norsborg, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

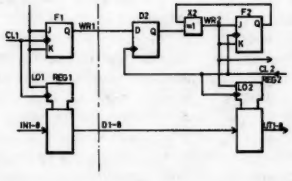
PCT No. PCT/SE87/00108, § 371 Date Dec. 16, 1987, § 102(e) Date Dec. 16, 1987, PCT Pub. No. WO87/06413, PCT Pub. Date Oct. 22, 1987

PCT Filed Mar. 5, 1987, Ser. No. 137,440

Claims priority, application Sweden, Apr. 18, 1986, 8601801

Int. Cl.[5] G06F *15/00, 1/12*

U.S. Cl. 364—900 **6 Claims**



1. An apparatus for transferring data words in parallel between transmitting and receiving equipment, comprising:

a transmitter means, in said transmitting equipment including a first retister, a first clock signal generator for generating first clock signals at a first frequency and a first logic circuit for continously outputting one of two values of a first write signal such that when said first write signal changes value said first register is enabled to allow transmission at said first frequency of a data word stored in said first register and the value of said first write signal remains unchanged until said transmission occurs;

a receiver means, in said receiving means including a second register for receiving data words transmitted from said first register, a second clock signal generator for generating second clock signals at a second frequency which is different from said first frequency, and a second logic circuit responsive to said first write signal and said second clock signal for generating a second write signal which directly enables said second register to allow transmission of data to other devices at a falling edge of said second write signal, said second logic circuit including:

a latch means for latching a change in said first write signal, wherein an output of said latch means changes at a falling edge of said second clock signal immediately following the latched change of said first write signal; and

a logic gate means, connected to an output of said latch means, for generating said second write signal when the output of said latch means changes;

whereby the duration said second write signal is only depended on said second frequency.

4,984,195

EXTENDED BUS CONTROLLER

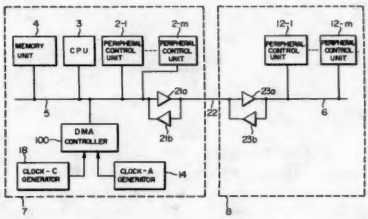
Masayuki Nakamura, Nagoya, and Fujiya Ikuta, Kani, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Chubu Software, Ltd., Aichi, both of, Japan

Filed Jun. 2, 1988, Ser. No. 201,443

Claims priority, application Japan, Jun. 3, 1987, 62-139486

Int. Cl.[5] G06F *13/28*

U.S. Cl. 364—200 **8 Claims**



1. An extended bus controller comprising:

a base module including at least one first peripheral control unit, a base bus, a central processing and controlling unit, and memory means for storing data, each of said at least one first peripheral control unit, said central processing and controlling unit, and said memory means being connected to said base bus;

an extension module including an extended bus and at least one second peripheral control unit connected to the extended bus;

a connection bus interconnecting the base bus of said base module and the extended bus of said extension module;

direct memory access control means provided for at least one of said base module and said extension module for directly controlling data transfer between said at least one first peripheral control unit and said at least one second peripheral control unit and said memory means;

first master clock signal generator means for supplying a first master clock signal to said direct memory access control means and controlling said direct memory access control means, said first master clock signal having a first frequency determined by a data transmission delay time associated with at least one of said base bus, said connection bus and said extension bus, and by performance of said at least one first peripheral control unit and said memory means; and

second master clock signal generator means for supplying a

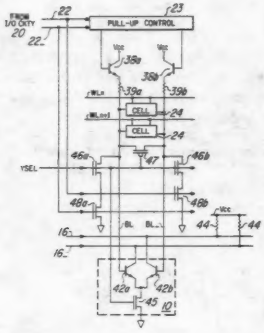
second master clock signal to said direct memory access control means and controlling said direct memory access control means, said second master clock signal having a second frequency determined by a data transmission delay time associated with at least one of said base bus, said connection bus and said extension bus, and by performance of said at least one second peripheral control unit and said memory means.

4,984,196

HIGH PERFORMANCE BIPOLAR DIFFERENTIAL SENSE AMPLIFIER IN A BIICMOS SRAM

Hiep V. Tran, Carrollton, and David B. Scott, Plano, both of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed May 25, 1988, Ser. No. 198,368
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—51 **11 Claims**



11. A read/write memory which comprises:

a memory array comprising rows and columns of memory cells, said columns of memory cells arranged in pairs;

an address buffer for receiving an address signal;

a row decoder, connected to said address buffer, for selecting a row of said array responsive to a row address portion of said address signal;

a plurality of first stage sense amplifiers each associated with a pair of said memory cell columns and each being positioned so as to fit within the pitches of the memory cells of their associated memory cell column pair and grouped into a first group and a second group, each of said first stage sense amplifiers associated with a column of said array;

a first local data bus connected to each of said first stage sense amplifiers in said first group;

a second local data bus connected to each of said first stage sense amplifiers in said second group;

a data-out bus;

a first second stage sense amplifier connected to said first local data bus and to said data-out bus;

a second second stage sense amplifier connected to said second local data bus and to said data-out bus; and

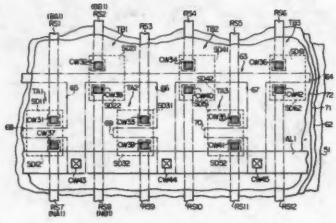
column decode means, connected to said address buffer, for selecting a first stage sense amplifier responsive to a column address portion of said address signal, and for selecting a second stage sense amplifier responsive to said column address portion of said address signal so that the selected second stage sense amplifier presents on said data-out bus the output of the first stage sense amplifier selected by said column decode means.

4,984,197

SEMICONDUCTOR MEMORY DEVICE HAVING TRANSFER GATES COUPLED BETWEEN BIT LINE PAIRS AND SENSE AMPLIFIER CIRCUITS

Takako Sakagami, Toyko, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,760
Claims priority, application Japan, Nov. 30, 1988, 63-303608
Int. Cl.[5] G11C *5/06*
U.S. Cl. 365—63 **8 Claims**



1. A semiconductor memory device fabricated on a semiconductor substrate in a multiple level structure including a lower insulating film, an inter-level insulating film and an upper level insulating film, comprising:

(a) a plurality of memory cells arranged in rows and columns;

(b) a plurality of first bit lines each coupled to the memory cells of every second column;

(c) a plurality of second bit lines respectively paired with said first bit lines for formation of a plurality of bit line pairs and respectively coupled to the memory cells of the other columns;

(d) a precharging circuit operative to provide a first voltage level on all of the bit line pairs;

(e) a dummy cell array coupled to said bit line pairs and operative to provide a reference voltage level on one of said first bit lines and said second bit lines;

(f) a plurality of sense amplifier circuits provided in association with said bit line pairs, respectively, and operative to increase small differences in voltage level on the respective bit line pairs;

(g) a plurality of first interconnections paired with a plurality of second interconnections for providing a plurality of interconnection pairs respectively coupled to said sense amplifier circuits, said first and second interconnections extending on said inter-level insulating film; and

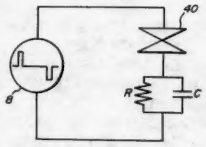
(h) a plurality of transfer gates respectively coupled between said bit line pairs and said interconnection pairs and gated by a transfer signal line so as to establish conduction paths for propagating said small differences to the sense amplifier circuits, respectively, said transfer gate line extending on said upper level insulating film, in which said transfer gates comprises respective source/drain regions formed in said semiconductor substrate and respective gate electrodes located on those areas of said lower level insulating film between the source/drain regions, respectively, wherein said transfer signal line is coupled to said gate electrodes through respective contact windows each located between the first and second interconnections of each interconnection pair.

4,984,198

LIQUID CRYSTAL ELECTROOPTIC MEMORY DEVICE

Shunsuke Kobayashi, Tokyo; Hidenori Ikeno, Koganei; Hiroki Maeda, Yokohama; Bai Y. Zhang, and Masaaki Yoshida, both of Tokyo, all of Japan, assignors to Tokyo University of Agriculture and Technology, Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,527
Claims priority, application Japan, Mar. 31, 1989, 1-78672
Int. Cl.[5] G11C *11/42, 13/04*
U.S. Cl. 365—108 11 Claims



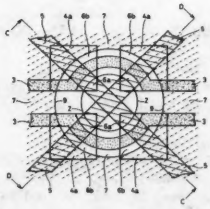
1. A liquid crystal electrooptic memory device, comprising a ferroelectric liquid crystal sandwiched by a pair of molecular oriented films attached to opposite surfaces thereof, the molecular oriented films having a certain electric conductivity; a pair of transparent conductive films attached to the outside surfaces of the molecular oriented films on opposite surfaces of the ferroelectric liquid crystal, respectively; an impedance connected to one of the transparent conductive films, the impedance having a constant electrostatic capacitance and a variable resistance; and an electric pulse source connected across the transparent conductive films through said impedance, whereby light transmittance of the ferroelectric liquid crystal is set at different levels in response to application of a pulse signal from the electric pulse source to said transparent conductive films depending on the resistance of the impedance, so as to memorize the resistance in form of the light transmittance of the ferroelectric liquid crystal.

4,984,199

SEMICONDUCTOR MEMORY CELLS HAVING COMMON CONTACT HOLE

Masahiro Yoneda; Masahiro Hatanaka; Yoshio Kohno; Shinichi Satoh; Hidekazu Oda, and Koichi Moriizumi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 94,647, Sep. 9, 1987, abandoned. This application May 30, 1989, Ser. No. 358,495
Claims priority, application Japan, Sep. 9, 1986, 61-213107
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] G11C *11/24*
U.S. Cl. 365—149 10 Claims



1. A semiconductor memory device comprising a semiconductor substrate,

four memory cells arranged in point symmetry on said substrate, and

one contact hole placed in the center of the point symmetry, wherein said contact hole comprises a plurality of contact regions electrically isolated from each other, said device further comprising

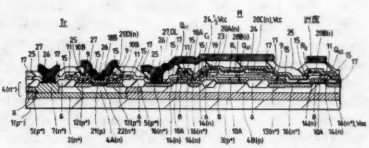
one bit line connected to two memory cells through said contact hole and another bit line connected to the remaining two memory cells through the same contact hole.

4,984,200

SEMICONDUCTOR CIRCUIT DEVICE HAVING A PLURALITY OF SRAM TYPE MEMORY CELL ARRANGEMENT

Ryuichi Saitoo, Ithaca, N.Y.; Osamu Saitoo, Tokyo, Japan; Takahide Ikeda, Tokorozawa, Japan; Mitsuru Hirao, Tohkai, Japan, and Atsushi Hiraishi, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,309
Claims priority, application Japan, Nov. 30, 1987, 62-305466; Nov. 30, 1987, 62-305467; Dec. 18, 1987, 62-320935
Int. Cl.[5] G11C *11/40;* H01L *27/04, 29/78*
U.S. Cl. 365—154 20 Claims



1. A semiconductor integrated circuit device including a SRAM having a plurality of memory cells arranged to correspond to the intersections of data and word lines, wherein each memory cell comprises:

a flip-flop circuit having two driver MISFETs;

two high resistance load elements; and

two transfer MISFETs

wherein said high resistance load elements are connected, through a conductive layer which is integrally made with said high resistance load elements, with the information storage nodes of said flip-flop circuit, wherein a plate electrode layer to be supplied with a predetermined potential is formed over said conductive layer through a dielectric film, and wherein an electric field shielding layer which is integrally made with said plate electrode is formed between said high resistance load elements and said data line which extends thereover, said electric field shielding layer being separated from said resistance load elements by an insulator film of a thickness greater than the thickness of said dielectric film.

4,984,201

SEMICONDUCTOR STORAGE DEVICE WITH COMMON DATA LINE STRUCTURE

Yoichi Sato, Iruma, and Masao Mizukami, Yokohama, both of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Jan. 16, 1990, Ser. No. 465,983
Claims priority, application Japan, Jan. 13, 1989, 1-7146
Int. Cl.[5] G11C *11/40, 11/407, 7/00*
U.S. Cl. 365—154 28 Claims

1. A semiconductor storage device comprising:

an intersecting arrangement of word lines and data lines;

a plurality of memory cells, each one being coupled to a respective word line and to a respective data line near an intersection thereof;

first selection means for selecting one of said word lines;

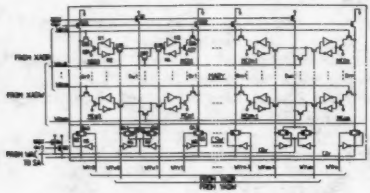
column switch means for coupling said data lines with a first common data line; and

second selection means being coupled to said column switch means and effecting selective coupling, through said column switch means, of one of said data lines with said first common data line;

wherein each one of said plurality of memory cells includes:

latch means for storing data and including at least a first node,

a first switch IGFET having a gate terminal coupled to a



word line of the corresponding memory cell and having first and second input/output terminals, the first input-/output terminal thereof being coupled with a data line of said corresponding memory cell, and

a second switch IGFET having a gate terminal coupled to the first node of said latch means and having first and second input/output terminals, the first input/output terminal thereof being coupled with the second input/output terminal of said first switch IGFET, and the second input-/output terminal thereof being applied with a first power-source voltage level.

4,984,202

LOW VOLTAGE-OPERATED SEMICONDUCTOR INTEGRATED CIRCUIT

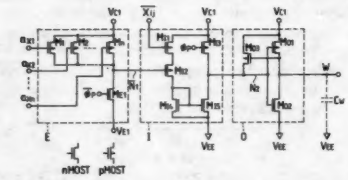
Takayuki Kawahara; Goro Kitsukawa; Yoshiki Kawajiri, and Kiyoo Itoh, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,238

Claims priority, application Japan, Mar. 20, 1989, 1-66128

Int. Cl.[5] G11C *13/00, 11/40*

U.S. Cl. 365—177 **15 Claims**



12. A semiconductor device comprising:

a semiconductor chip;

input circuit means for receiving an input signal, provided on the semiconductor chip;

internal circuit means for receiving an output signal of the input circuit means, provided on the semiconductor chip;

output circuit means for receiving an output signal of the internal circuit means, provided on the semiconductor chip; and

first voltage converter means for converting an external supply voltage to an internal supply voltage, provided on the semiconductor chip,

wherein:

the input circuit means comprises bipolar transistors;

the output circuit means comprises bipolar transistors;

the internal circuit means comprises complementary insulated gate field-effect transistors;

the input circuit means receives the external supply voltage;

the output circuit means receives the external supply voltage; and

the internal circuit means receives the internal supply voltage outputted by the first voltage converter means.

4,984,203

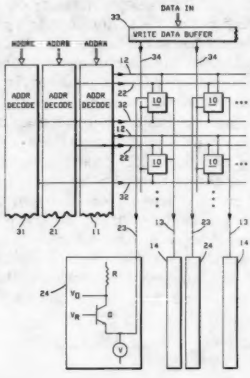
HIGH SPEED STATIC BICMOS MEMORY WITH DUAL READ PORTS

Rimon Shookhtim, La Jolla; Lo-Shan Lee, San Diego, and Babak Mansoorian, La Jolla, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 20, 1989, Ser. No. 453,567

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—177 **14 Claims**



1. A memory which includes a plurality of cells with each cell containing a pair of cross-coupled field-effect transistors having set and reset nodes, select lines in said memory for selecting certain cells to be read, and bit lines which receive data read from a selected cell; wherein: each cell has a first read port which includes a first pull-up means that is coupled from a first select line to said set node plus a first bipolar transistor that is coupled from said set node to a first bit line; and, each cell has a second read port which includes a second pull-up means that is coupled from a second select line to said reset node plus a second bipolar transistor that is coupled from said reset node to a second bit line.

4,984,204

HIGH SPEED SENSOR SYSTEM USING A LEVEL SHIFT CIRCUIT

Yoichi Sato, Iruma; Masao Mizukami, Yokohama, and Toshiyuki Ookuma, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,472

Claims priority, application Japan, Jan. 28, 1988, 63-17586; May 24, 1988, 63-126891; Aug. 3, 1988, 63-193997; Aug. 12, 1988, 63-201470; Nov. 17, 1988, 63-290758; Nov. 25, 1988, 63-295955

Int. Cl.[5] G11C *7/00*

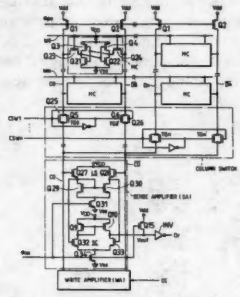
U.S. Cl. 365—189.11 **89 Claims**

1. A semiconductor memory wherein reading out data information of memory cells is selectively performed through re-

spective data lines and wherein said semiconductor memory has a sense amplifier arrangement coupled between a first supply potential and a second supply potential, comprising:

a precharging switching circuit, coupled to said data lines, being in an ON state for precharging said data lines to a level of about said first supply potential and being in an OFF state during a read mode of operation of said memory;

a level shift circuit having at least one input, selectively coupled to a memory cell during said read mode of operation of said memory and including at least one output for providing an output level; and



a sensing circuit, having at least one input, coupled to said at least one output of said level shift circuit and providing an output signal in accordance with the data information read-out from said selectively coupled memory cell of said semiconductor memory, said sensing circuit being responsible to a level shifted signal from said level shift circuit of a potential level intermediate said first supply potential and said second supply potential.

4,984,205

SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED INDICATOR OF STATE OF REDUNDANT STRUCTURE

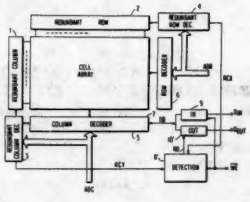
Tadahiko Sugibayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,612

Claims priority, application Japan, Mar. 28, 1988, 63-73993

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—200 **4 Claims**



1. A semiconductor memory device comprising a normal array of normal memory cells, a redundant array of redundant memory cells, a selection circuit coupled to said normal array and said redundant array for operatively selecting one of said normal memory cells and said redundant memory cells in response to address data, an output terminal, an external terminal receiving a first voltage signal of a normal voltage range and a second voltage signal outside said normal range, a voltage detection circuit coupled to said external terminal, said voltage detection circuit generating a first control signal when said external terminal receives said first voltage signal and a second control signal when said external terminal receives said second voltage signal, an output circuit coupled to said selection circuit and said output terminal for operatively outputting data from the selected memory cell at said output terminal in a first mode and setting said output terminal at a predetermined state irrespective of read data from the selected memory cell in a second mode, a detection circuit coupled to said selection circuit for generating a detection signal when one of said redundant memory cells is selected by said address data, and a control circuit for setting said output circuit in said first mode in response to said first control signal and in said second mode when both said second control signal and detection signal are present.

4,984,206

RANDOM ACCESS MEMORY WITH REDUCED ACCESS TIME IN READING OPERATION AND OPERATING METHOD THEREOF

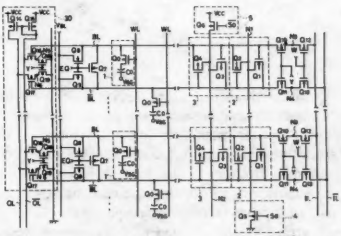
Takahiro Komatsu; Hiroyuki Yamasaki; Katsumi Dosaka, and Yoichi Tobita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 372,441

Claims priority, application Japan, Jun. 27, 1988, 63-159805

Int. Cl.[5] G11C *11/34*

U.S. Cl. 365—208 **32 Claims**



18. A semiconductor memory device having a memory cell array comprising a plurality of memory cells arranged in rows and columns, a plurality of word lines for selecting one row out of said memory cell array, and a plurality of bit lines for selecting one column out of said memory cell array, said plurality of bit lines constituting a pair of folded bit lines, comprising:

row address inputting means for receiving an externally applied row address,

row selecting means responsive to the row address from said row address inputting means for selecting one row out of said memory cell array,

column address inputting means for receiving an externally applied column address,

column selecting means responsive to the column address from said column address inputting means for selecting one bit line pair to select memory cells in one column out of said memory cell array,

write-in signal inputting means for receiving an externally applied write-in signal,

a pair of write-in data transferring lines for transferring data to be written in a memory cell selected by said row address and said column address at the time of data writing,

combining means for combining an output of said column selecting means and said write-in signal from said write-in signal inputting means to form an input line connect signal;

connecting means responsive to said input line connect signal for connecting the bit line pair selected by said

column address to said pair of write-in data transferring lines at the time of data writing,

a pair of read-out data transferring lines provided separately from said pair of write-in data transferring lines for transferring data on a bit line pair selected by said column address at the time of data reading, and

amplifying means including a current mirror responsive to the output of said column selecting means for driving said pair of read-out data transferring lines in accordance with data on said selected bit line pair.

4,984,207

SEMICONDUCTOR MEMORY DEVICE

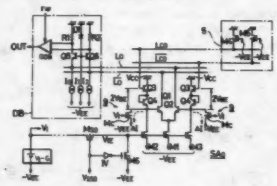
Minoru Tateno, and Akira Ide, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 216,652, Jul. 7, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 490,550

Claims priority, application Japan, Jul. 10, 1987, 62-170909

Int. Cl.[5] G11C *11/34*

U.S. Cl. 365—208 **44 Claims**



1. A semiconductor memory device having a sense amplifier which amplifies read signals from a memory cell, comprising:

a pair of bipolar transistors which are included in said sense amplifier and which have their emitters connected in common, thereby to construct a differential pair,

input means for transmitting the read signals to bases of said pair of bipolar transistors, respectively,

first current means coupled to the common emitters of said pair of bipolar transistors for providing an operating current,

second and third current means coupled to said bases of said pair of bipolar transistors, respectively, for providing currents to bias said bases of said pair of bipolar transistors,

output means coupled to collectors of said pair of bipolar transistors for providing an output signal in accordance with outputs provided from said collectors of said pair of bipolar transistors, and including a collector voltage setting circuit for setting voltages on said collectors of said pair of bipolar transistors at predetermined voltages,

control means for controlling said currents to flow through said second and third current means, and

saturation preventive means coupled to said bases of said pair of bipolar transistors, respectively, for preventing said pair of bipolar transistors from falling into saturation states.

4,984,208

DYNAMIC READ/WRITE MEMORY WITH IMPROVED REFRESHING OPERATION

Kazuhiro Sawada, Yokohama; Takayasu Sakurai, Tokyo, and Kazutaka Nogami, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 12,315, Feb. 9, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 364,529

Claims priority, application Japan, Feb. 14, 1986, 61-30139

Int. Cl.[5] G11C *7/00, 11/406, 11/401*

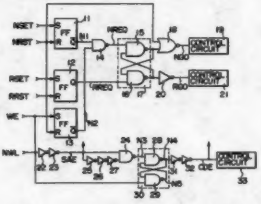
U.S. Cl. 365—222 **9 Claims**

9. A dynamic read/write memory in which stored data is refreshed within a read cycle period and a write cycle period, comprising:

first means, coupled to a word line of said memory that is defined by a predetermined address value, for rendering said word line operative substantially continuously within the write cycle period in response to a data write request signal, said first means including:

first request signal generating means, responsive to said data write request signal, for generating a normal operation request signal,

selection means, coupled to said first signal generating means and receiving a predetermined refreshing operation request signal, for selecting and outputting one of said normal operation request signal and said predetermined refreshing operation request signal, wherein said



normal operation request signal is selected and output when said normal operation request signal is high and is received before said predetermined refreshing operation request signal, and

first word line control means, coupled to said selection means and receiving a reset signal and the selected signal, for generating a word line drive signal on said word line to render said word line operative, wherein said word line drive signal is generated when the selected signal is the normal operation request signal and the reset signal indicates that a data read request for said memory is disabled; and

second means, coupled to said first means, for rendering said word line operative only within a portion of the read cycle period, said portion being substantially less than the entire read cycle period.

4,984,209

BURST REFRESH OF DYNAMIC RANDOM ACCESS MEMORY FOR PERSONAL COMPUTERS

Babu Rajaram, St. Joseph, and Mark J. Foster, Stevensville, both of Mich., assignors to Zenith Data Systems Corporation, Mt. Prospect, Ill.

Filed Oct. 30, 1987, Ser. No. 114,770

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—222 **12 Claims**

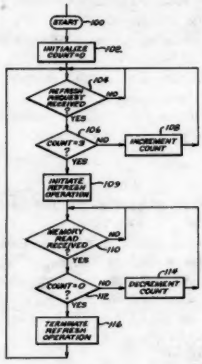
1. A method for maintaining information stored in a dynamic random access memory with a refresh controller, said method comprising:

accumulating a count of a plurality of periodic refresh request signals;

enabling said refresh controller to have control of said dynamic random access memory, said memory having a plurality of rows, when said count reaches a select number;

sequentially refreshing a plurality of said rows equal in number to said select number; and

disabling said refresh controller from having control of said dynamic random access memory after performing said



sequentially refreshing step until a subsequent accumulated count reaches said select number.

4,984,210

SEMICONDUCTOR MEMORY DEVICE IMPROVED FOR EXTERNALLY DESIGNATING OPERATION MODE

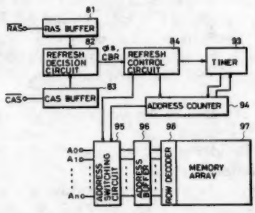
Masaki Kumanoya; Katsumi Dosaka; Yasuhiro Konishi; Takahiro Komatsu, and Youichi Tobita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 313,558, Feb. 22, 1989. This application Aug. 10, 1990, Ser. No. 565,400

Claims priority, application Japan, Aug. 31, 1988, 63-218709

Int. Cl.[5] G11C *11/40, 13/00*

U.S. Cl. 365—222 **1 Claim**



1. A semiconductor memory device operating in at least first and second operation modes comprising:

means for receiving at least one variable length control signal to externally control said memory device,

said control signal having at least one cycle period;

operation means for operating said memory device in response to said control signal; and

cycle time comparing means for comparing a time period of one cycle of said control signal with a predetermined time period of a memory cycle,

said operating means operating said memory device in either said first or second operation mode in response to the result of the comparison by said cycle time comparing means.

4,984,211

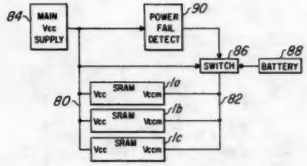
BATTERY BACKUP BUS SCHEME FOR AN ECL BICMOS SRAM

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 16, 1988, Ser. No. 156,400

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—229 **9 Claims**



7. A memory system, comprising:

a memory device comprising:

an array of memory cells for storing data therewithin;

peripheral circuitry for accessing the data stored in said array;

a first power supply terminal connected to said peripheral circuitry for receiving a biasing voltage for biasing said peripheral circuitry;

a second power supply terminal connected to said array for receiving a biasing voltage for biasing the array; and

a reference power supply connected to both the array and the peripheral circuitry for providing a reference biasing voltage thereto;

a main power supply source connected to said first power supply terminal;

a power fail detector connected to said main power supply source, and having an output;

a battery;

a switch having a first input connected to said main power supply source, a second input connected to said battery, an output connected to said second power supply terminal, and a control input connected to said power fail detector so that said main power source is connected to said second power supply terminal responsive to said power fail detector detecting said main power source being above a predetermined voltage, and so that said battery is connected to said second power supply terminal responsive to said power fail detector detecting said main power source being below said predetermined voltage.

4,984,212

SEMICONDUCTOR MEMORY

Minoru Fukuda, Tateno; Hideaki Takahashi, Koganei, both of Japan; June Sugiura, Troy, N.Y.; Fumio Tsuchiya, Kodaira, and Toshimasa Kihara, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 277,131, Nov. 29, 1988, Pat. No. 4,905,195, which is a division of Ser. No. 75,986, Jul. 21, 1987, Pat. No. 4,788,665, which is a division of Ser. No. 770,576, Aug. 29, 1985, Pat. No. 4,691,298. This application Feb. 14, 1990, Ser. No. 480,009

Claims priority, application Japan, Sep. 26, 1984, 59-199576

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—230.03 **23 Claims**

1. A semiconductor memory comprising:

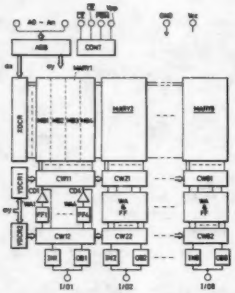
a plurality of memory blocks each of which includes a memory cell block having a plurality of data lines and a plurality of semiconductor nonvolatile memory cells which can be erased and electrically written into; and

a plurality of external data terminals which correspond in number to the number of memory blocks in said plurality of memory blocks and being respectively coupled therewith in a one to one manner, each external data terminal

being adapted to receive serially supplied input data to be written into the memory cell block of a corresponding memory block coupled therewith,

wherein each one of said plurality of memory blocks further comprises:

selecting means, having a plurality of inputs and a plurality of outputs which are greater in number than the number of said inputs thereof and which outputs are coupled to the data lines in the corresponding memory



cell block, for providing data supplied on predetermined inputs thereof to said data lines, and

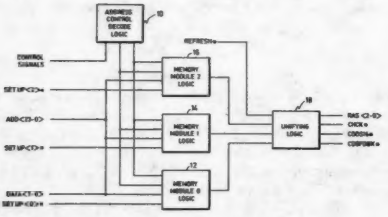
converting means, having an input coupled to a corresponding external data terminal and a plurality of outputs which correspond in number to the number of inputs of said selecting means and which are respectively coupled therewith, for converting said serially supplied input data into a plurality of parallel output data.

4,984,213

MEMORY BLOCK ADDRESS DETERMINATION CIRCUIT

David G. Abdoo, Spring, and Dale J. Mayer, Cypress, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 21, 1989, Ser. No. 313,237
Int. Cl.[5] G11C *7/00, 8/00, 11/407*
U.S. Cl. 365—230.3 **8 Claims**



1. A circuit for determining if a second block of memory contained on a circuit board having capacity for at least two memory blocks is being addressed, the circuit board receiving the memory addresses associated with a memory request, comprising:

means for storing values representing the starting address of the first memory block;

means for storing values representing the enabled states of the first and second blocks of memory;

an adder for adding values representing the starting address of the first block of memory and a value representing the enabled state of the first block of memory to determine values representing the starting address of the second block of memory;

a comparator for comparing values representing the starting address of the second block of memory as determined by said adder with the requested memory address to determine if the requested memory address is addressing the second block of memory;

means for determining if the second memory block is present on the circuit board; and

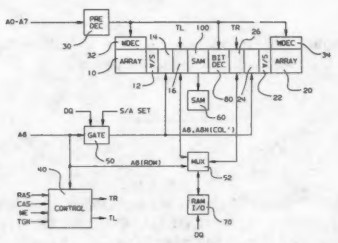
wherein said comparator disables the comparison if the second memory block is not present.

4,984,214

MULTIPLEXED SERIAL REGISTER ARCHITECTURE FOR VRAM

Nathan R. Hiltebeitel, South Burlington; Robert Tamlyn, and Steven W. Tomashot, both of Jericho, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1989, Ser. No. 446,032
Int. Cl.[5] G11C *7/00, 8/00*
U.S. Cl. 365—230.05 **6 Claims**



1. A dual-port DRAM, comprising:

first and second arrays of memory cells, each comprising a plurality of word lines and a plurality of bit lines coupled to a plurality of memory cells, and a plurality of sense amplifiers coupled to said plurality of bit lines;

a parallel input-output port;

a serial input/output port;

a first set of transistor devices coupled to a set of said plurality of bit lines of said first array of memory cells and to a set of said plurality of bit lines of said second array of memory cells, for selecting at least one of said plurality of bit lines from each of said first and second arrays of memory cells;

a second set of transistor devices responsive to a first enable signal for coupling at least one of said plurality of bit lines selected by said first set of transistor devices to said parallel input/output port, and

a third set of transistor devices responsive to a second enable signal for coupling at least one of said plurality of bit lines selected by said first set of transistor devices to said serial input/output port.

4,984,215

SEMICONDUCTOR MEMORY DEVICE

Yuki Ushida, Tokyo, Japan, assignor to Oki Electric Industry Co., Inc., Japan

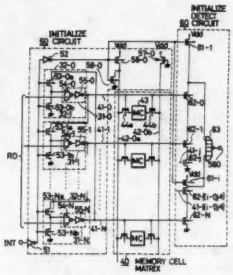
Filed Jun. 29, 1989, Ser. No. 374,291
Claims priority, application Japan, Jul. 4, 1988, 63-166290
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—230.06 **9 Claims**

1. A semiconductor memory device comprising:

a memory cell matrix having memory cells connected to word lines and bit lines and arranged in rows and columns to form a matrix;

a row address decoder for decoding row address signals to supply decode outputs to the respective word lines for selecting one of the word lines to cause the selected word line to be in the active state;

a column address decoder for decoding column address signals to select one of the bit lines; and



an initialize circuit responsive to an initialize signal to set all the bit lines at a predefined initial level, and to cause the word lines other than said selected word line to be in the active state sequentially.

4,984,216

OPERATION MODE SETTING CIRCUIT FOR DRAM

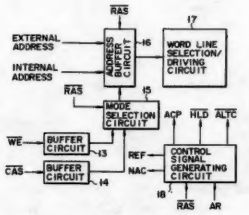
Haruki Toda, Yokohama; Shigeo Ohshima, Tokyo, and Tatsuo Ikawa, Mitaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 8, 1989, Ser. No. 307,701

Claims priority, application Japan, Feb. 12, 1988, 63-30441

Int. Cl.[5] G11C *8/00*

U.S. Cl. 365—230.08 **17 Claims**



1. An operation mode setting circuit for a dynamic random access memory comprising:

first means for converting the level of a mode setting signal;

second means for converting the level of a column address strobe signal;

mode selection means for latching and outputting a mode selection signal in response to output signals from said first means, said second means and a row address strobe signal;

latching means responsive to said mode selection signal and said row address strobe signal for latching one of an exterior address signal and an interior address signal, and for outputting a latched signal;

word line selection means for selecting a word line of said dynamic random access memory in response to said latched signal; and

control signal generation means for generating a control signal for controlling said latching means in response to said row address strobe signal and an auto-refresh signal which controls an auto-refresh mode.

4,984,217

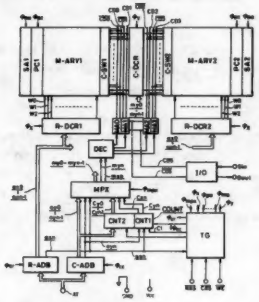
SEMICONDUCTOR MEMORY

Katsuyuki Sato, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 214,542, Jul. 1, 1988, Pat. No. 4,899,312. This application Nov. 24, 1989, Ser. No. 440,878

Int. Cl.[5] G11C *8/00*

U.S. Cl. 365—230.09 **5 Claims**



1. An address multiplexed dynamic memory comprising:

a first external terminal for receiving a row address strobe signal;

a second external terminal for receiving a column address strobe signal;

a third external terminal for delivering an output signal;

a plurality of terminals for receiving row or column address signals;

first means, coupled to said plurality of terminals, for taking in a first set of row address signals in response to a falling edge of said row address strobe signal;

second means, coupled to said plurality of terminals, for taking in a first set of column address signals in response to a first falling edge of said column address strobe signal after said falling edge of said row address strobe signal and taking in a second set of column address signals in response to a second falling edge of said column address strobe signal;

third means for reading out a first set of signals from a plurality of memory cells selected according to said first set of row address signals and said first set of column address signals and reading out a second set of signals from a plurality of memory cells selected according to said first set of row address signals and said second set of column address signals; and

fourth means for transferring said first set of signals and said second set of signals to said third external terminal sequentially in response to a transition said column address strobe signal after said first falling edge.

4,984,218

MARINE ACOUSTIC ARRAY CONFIGURED FOR TOW NOISE REDUCTION

Sammie F. Ritter, Flower Mound, and Stephen A. Caldwell, Runaway Bay, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

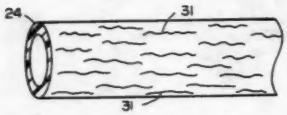
Filed Apr. 26, 1990, Ser. No. 514,902

Int. Cl.[5] G01V *1/38*; H04R *1/44*

U.S. Cl. 367—15 **4 Claims**

1. A marine acoustic array for towing through a water layer comprising a plurality of linear sections having acoustic sensors for the detection of acoustic reflection signals, each of said sections comprises a flexible outer hose wall with its outer surface molded in a non-smooth configuration to spread the turbulent boundary layer of water created adjacent the array as it is towed through the water layer outward from the array

to reduce the intensity of the centered tow noise resulting from such turbulent boundary layer of water on the acoustic sensors



and to eliminate rotational forces on each of said sections of the array as it is towed through the water layer.

4,984,219

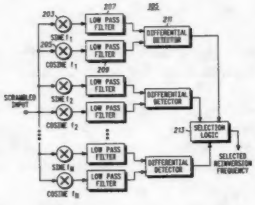
METHOD AND APPARATUS FOR DECODING OF FREQUENCY INVERSION BASED SCRAMBLERS

Daniel P. Brown, Elmhurst, and Larry C. Puhl, Sleepy Hollow, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1989, Ser. No. 456,881

Int. Cl.[5] H04K *1/04*

U.S. Cl. 380—39 **8 Claims**



1. A quadrature amplitude modulation detector for determining a frequency of an input signal, comprising:

a first quadrature signal detector generating a first difference signal having a magnitude related to a difference between first quadraturely related signals;

a second quadrature signal detector generating a second difference signal having a magnitude related to a difference between second quadraturely related signals;

means for determining which of said first difference signal and said second difference signal has a greater magnitude;

means, responsive to said means for determining, for generating a conversion signal; and

means, coupled to said means for generating a conversion signal, for mixing the input signal with said conversion signal to produce an output signal.

4,984,220

GEOPHYSICAL EXPLORATION USING VELOCITY SPECTRA REGIONAL COHERENCY PEAKS

John H. Bodine, Houston, Tex.; John N. Gallagher, and James H. Wright, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 6, 1989, Ser. No. 319,608

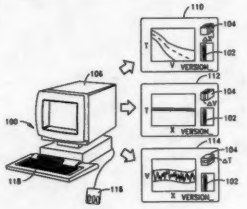
Int. Cl.[5] G01V *1/28, 1/34*

U.S. Cl. 367—68 **39 Claims**

1. Apparatus for geophysical exploration comprising:

projecting and displaying means for projecting onto and displaying in a single plane in at least the T-V domain, and optionally in the T-X and V-X domains a set -(T,V,X,C')- of velocity spectra local coherency maxima points (T,V,X,C') from a plurality of velocity spectra in T-V domains at a plurality of positions X along a seismic line of exploration, each (T,V,X,C') point representing travel time T and velocity V location of a regional coherency maximum C' on one of the plurality of velocity spectra in a T-V domain at a position X along the seismic line of exploration;

third variable visual value means for assigning different visual values to different values of X being displayed in the T-V domain; and



function defining means for inputting selected points in the displayed domain by operations functionally connected to the displayed domain and for mathematically relating the selected points and defining a function between the variables of the displayed domain.

4,984,221

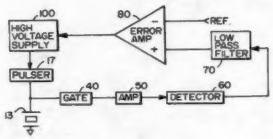
BOREHOLE ACOUSTIC LOGGING SYSTEM HAVING AUTOMATIC REFLECTION SIGNAL LEVEL CONTROL

Charles L. Dennis, Richardson, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 6, 1990, Ser. No. 475,555

Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—69 **3 Claims**



1. A method for the acoustic logging of subsurface formations surrounding a bore hole, comprising the steps of:

(a) directing pulses of acoustic energy in a circular scanning pattern around the wall of said borehole and receiving direct reflections of said acoustic energy pulses from the wall of said borehole,

(b) generating reflection signals representative of the acoustic energy of the direct reflections received from the borehole wall,

(c) generating a reference signal representative of said reflected acoustic energy with borehole acoustic noise amplitude removed,

(d) producing an error signal representative of amplitude differences between said reflection signals and said reference signal,

(e) providing a voltage source with output varying in response to said error signal, and

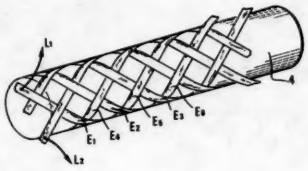
(f) utilizing the variable output of said voltage source to control the amount of acoustic energy directed from said transducer toward said borehole wall such that the generated reflection signals maintain a constant amplitude with respect to said reference signal so as to reduce the amplitude of the generated reflection signal by the amount of borehole acoustic noise amplitude.

4,984,222

PIEZOELECTRIC SENSOR COMPRISING AT LEAST ONE PAIR OF FLEXIBLE SENSITIVE ELEMENTS OF GREAT LENGTH

Claude Beauducel, Henonville, and Etienne Bolze, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jul. 11, 1989, Ser. No. 378,323
Claims priority, application France, Jul. 11, 1989, 88 09519
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—159 8 Claims



1. An improved piezoelectric sensor formed from sensitive elements, each sensitive element comprising a substrate of a flexible material having piezoelectric properties, at least one fine electrode disposed on a respective side of the substrate, wherein said sensitive elements are interlaced so that the respective electrodes of one of the respective elements are alternately in electric contact with the respective same electrodes of at least one other sensitive element.

4,984,223

ANALOG STYLE ELECTRONIC WATCH

Wonjung Cho, Inchon, and Kwangju Choi, Kyonggi, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

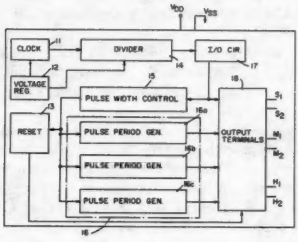
Continuation of Ser. No. 287,228, Dec. 21, 1988, abandoned.
This application Apr. 12, 1990, Ser. No. 508,527
Claims priority, application Rep. of Korea, Dec. 31, 1987, 87-15639
Int. Cl.[5] G04B *19/00;* G04F *5/00*
U.S. Cl. 368—76 5 Claims

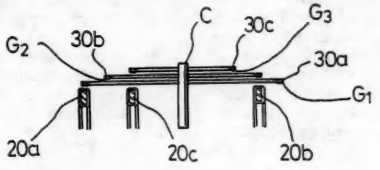
1. An analog style electronic watch comprising:

A. a plurality of rings having discrete magnetic elements adapted to rotate about an axis for indicating respective units of time,

B. a control circuit for generating drive pulses for each said ring,

C. drive means for each of said plurality of rings responsive to said control circuit and being disposed in a magnetic relation with said magnetic elements of said rings, said drive means comprising electromagnetic means having a current winding for receiving said drive pulses, each of said electromagnetic means and the corresponding current winding generating asymmetric magnetic fields of alternating polarity in accordance with said drive pulses, whereby said asymmetric magnetic fields produce attractive and repulsive forces between respective magnetic





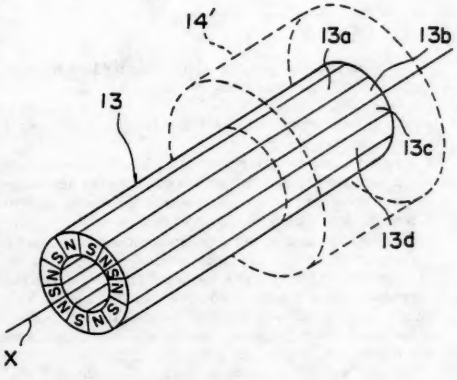
elements on said rings thereby driving said ring about said axis.

4,984,224

APPARATUS FOR RECORDING AND/OR ERASING AN INFORMATION SIGNAL ON AND FROM A MAGNETO-OPTICAL DISK WHEREIN THE MAGNETIC BIASING FIELD MEANS IS PART OF A ROTOR MAGNET INCLUDED IN A STEPPING MOTOR

Hiroshi Tsuyuguchi; Yasushi Noda, both of Tokyo, and Keiji Uehara, Iruma, all of Japan, assignors to Teac Corporation, Japan

Filed Nov. 7, 1989, Ser. No. 432,477
Claims priority, application Japan, Nov. 10, 1988, 63-146840[U]
Int. Cl.[5] G11B *13/04, 11/10, 11/12*
U.S. Cl. 369—013 5 Claims



1. An apparatus for recording and/or erasing an information

signal on and from a magneto-optical disk mounted on the apparatus, comprising:

optical pickup means disposed at a first side of the magneto-optical disk for producing an optical beam such that the optical beam is focused on the first side of the magneto-optical disk;

pickup feeding means provided on a frame of the magneto-optical disk apparatus for moving the optical pickup means along a path extending in a radial direction of the disk;

a stepping motor disposed at a second side of the magneto-optical disk, said stepping motor having a housing containing a rotor magnet and a stator winding surrounding the rotor magnet, said rotor magnet comprising a plurality of elongated magnetic parts magnetized to either one of the N-pole and S-pole and arranged with alternate polarity about a rotary axis of the stepping motor such that each of the elongated magnetic parts extends parallel to the rotary axis, said rotor magnet further extending beyond the housing of the stepping motor to provide a magnetic biasing field to the disk during said recording and/or erasing; and

mounting means for mounting the stepping motor on the frame of the apparatus such that the rotor magnet projecting beyond the housing of the stepping motor extends substantially parallel to the disk along said path of the optical pickup means.

4,984,225

SYSTEM FOR APPLYING MAGNETIC FIELD TO OPTO-MAGNETIC MEMORY

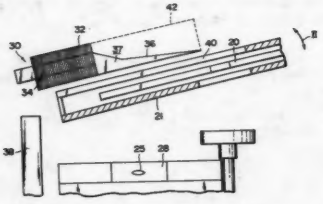
Hideo Ando, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1988, Ser. No. 174,358

Claims priority, application Japan, Mar. 31, 1987, 62-78620; Mar. 31, 1987, 62-78663; Mar. 31, 1987, 62-78668; Mar. 31, 1987, 62-78673

Int. Cl.[5] G11B *13/04, 11/10*

U.S. Cl. 369—13 **5 Claims**



1. An apparatus for applying a magnetic field to an opto-magnetic recording medium, comprising:

a magnetic core member;

means wound around said core member, for generating a magnetic flux in said core;

a magnetic extending member extending from said core member and having a flat surface opposing the opto-magnetic recording medium, the magnetic field being applied from said surface to said opto-magnetic recording medium, said extending member having a long axis, and a tapering shape with the cross-sectional area oriented orthogonally to the long axis, and a tapering shape with the cross-sectional area continuously reduced along said long axis; wherein said core member has an axis, and said extending member has a long axis parallel to said axis; and

a magnetic yoke member magnetically coupled to said core member so that a magnetic field passing through said opto-magnetic recording medium is returned to said yoke member.

4,984,226

MAGNETOPTIC HEAD FOR RECORDING/ERASING INFORMATION USING A CYLINDRICAL HOLLOW PERMANENT MAGNET

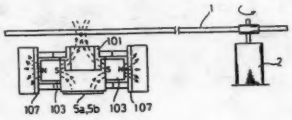
Hiromichi Kobori, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

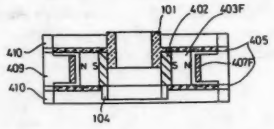
Division of Ser. No. 77,851, Jul. 27, 1987, Pat. No. 4,868,802. This application Sep. 5, 1989, Ser. No. 402,760

Claims priority, application Japan, Jul. 28, 1986, 61-175585; Jul. 28, 1986, 61-175586; Feb. 13, 1987, 62-29695

Int. Cl.[5] G11B *11/04, 11/14*

U.S. Cl. 369—13 **1 Claim**





1. A magnetooptic head for recording/erasing information on/from a recording medium by irradiating the recording medium with a laser beam within a recording/erasing external magnetic field applied to the recording medium, which comprises:

(a) a cylindrical condenser lens for focusing the beam on the recording medium;

(b) a cylindrical hollow permanent magnet fixedly arranged outside said condenser lens coaxially therewith and magnetized radially from a center thereof to an outer circumferential surface thereof; for generating a recording/erasing external magnetic field and focusing actuator magnetic field in a radial direction of said condenser lens on the basis of an axial magnetic flux component thereof;

(c) a cylindrical focusing coil arranged outside said cylindrical hollow permanent magnet coaxially therewith within the magnetic field generated by said cylindrical hollow permanent magnet for moving said condenser lens and said cylindrical hollow permanent magnets together in the axial direction of the recording medium to provide a focusing servo operation of the laser beam in cooperation with a radial magnetic component of said permanent magnet; and

(d) an elastic member for movably supporting said condenser lens and said permanent magnet together relative to said focusing coil in the axial direction of said recording medium.

4,984,227
OPTICAL DISC DEVICE

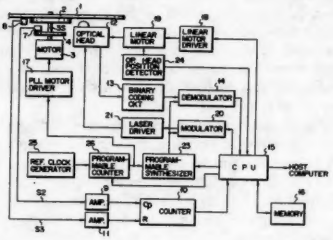
Tomohisa Yoshimaru, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 230,711, Aug. 10, 1988, abandoned, which is a continuation of Ser. No. 9,584, Jan. 29, 1987, abandoned, which is a continuation of Ser. No. 704,466, Feb. 22, 1985, abandoned. This application Mar. 16, 1989, Ser. No. 325,052

Claims priority, application Japan, Feb. 23, 1984, 59-32825

Int. Cl.[5] G11B *21/08, 19/26*

U.S. Cl. 369—32 4 Claims



1. An optical disk device for recording data on and reproducing data from an optical disc, comprising:

a motor for rotating the optical disk, the optical disk having an inner recording area and an outer recording area which overlap to each other and having a number of continuous blocks provided along a helical groove and divided into a plurality of block groups each having a predetermined number of blocks, the blocks each having a constant length;

a reference clock generator for generating clock pulses;

a programmable counter connected to said reference clock generator, for counting the clock pulses in one of a binary mode and a ternary mode and for selectively outputting first and second output signals corresponding respectively to the binary mode and the ternary mode, the first output signal having a first frequency, the second output signal having a second frequency, the binary mode being for accessing the inner recording area, and the ternary mode being for accessing the outer recording area;

a motor driver connected to said motor and said programmable counter for driving said motor, in response to a selective one of the first and second output signals, to make the optical disk rotate at a corresponding one of a first rotating speed and a second rotating speed;

block designating means for selectively designating a block to be recorded and a block to be reproduced;

control means connected to said block designating means and said programmable counter for determining a clock frequency required for recording data on and reproducing data from the designated block, said control means including means for storing a plurality of different clock-rate parameters corresponding respectively to the block groups, means for reading out from among the clock-rate parameters one clock-rate parameter which corresponds to the designated block, and means for calculating the clock frequency from the clock-parameter readout and the first and second output signals and outputting a clock signal having the clock frequency determined for every block group;

modulating/demodulating means for selectively modulating and demodulating the data so that the data corresponding to the blocks included in the block group corresponding to the designated block are modulated and demodulated by the clock signal; and

means for recording the data, modulated by said modulating/demodulating means, on the optical disc.

4,984,228
DUAL DRIVE CHANGER FOR RECORDS

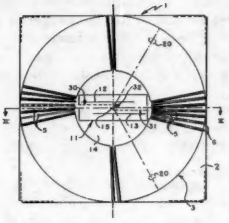
Louis P. C. Agostini, Sint-Pieters-Leeuw, Belgium, assignor to Staar S. A., Belgium

Filed Dec. 28, 1988, Ser. No. 291,253

Claims priority, application Belgium, Jan. 13, 1988, 8800040

Int. Cl.[5] G11B *17/24*

U.S. Cl. 369—37 22 Claims



1. A changer for sequentially playing back recorded information from at least two selected records comprising:

a magazine for storing records along each of a plurality of storage planes;

first and second transfer and playback mechanisms having record transfer planes which are spaced laterally and are generally parallel to each other;

means for mounting said magazine and said first and second mechanisms, respectively, for relative movement, different ones of the storage planes of said magazine being aligned with said mechanisms as said mechanisms and said magazine move relative to each other, to align the storage plane of a selected record with the record transfer plane of one of said mechanisms while another previously selected record is being cued or recorded information thereof is being played back in the other of said mechanisms in order that records may be played back sequentially without any interruption.

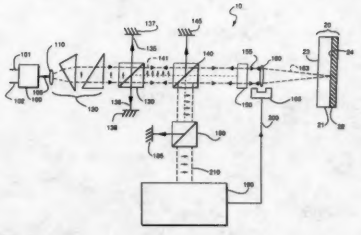
4,984,229
AUTOFOCUS SYSTEM

Francis J. Nedvidek, Midland, Canada, assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 18, 1988, Ser. No. 273,421

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.24 17 Claims



1. Autofocus apparatus for use in an optical system which utilizes a recording medium comprised of a birefringent medium and a radiation-sensitive medium, said autofocus appara-

tus automatically focusing radiation through the birefringent medium and substantially at the interface between the birefringent medium and the radiation-sensitive medium, said autofocus apparatus comprising:

means for providing radiation which is substantially linearly polarized along a first direction;

transformation means, disposed in the path of said linearly polarized radiation, for converting said linear polarization to a predetermined polarization, which predetermined polarization can be rendered linearly polarized by transmission through the transformation means;

focusing means, disposed in the path of the radiation having said predetermined polarization, for focusing said radiation onto the recording medium after which it is reflected from a first surface of the birefringent medium and from the interface between the birefringent medium and the radiation-sensitive medium and passes back through the focusing means and the transformation means;

means for deflecting said reflected radiation returning from said recording medium;

isolation means, disposed in the path of the deflected radiation, for isolating different components of polarization thereof;

error means, disposed in the path of the isolated radiation having a component of polarization which is substantially parallel to the first direction, for providing a focus-error signal; and

means for adjusting the focus of the focusing means in response to the focus-error signal.

4,984,230

REWRITABLE OPTICAL DISK WITH DEFECTIVE-SECTOR SUBSTITUTION ARRANGEMENT AND OPTICAL INFORMATION RECORDING AND REPRODUCING SYSTEM

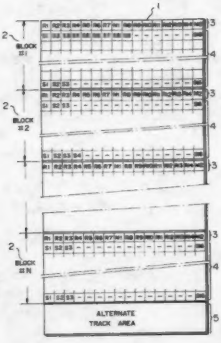
Isao Satoh, Neyagawa; Yoshihisa Fukushima, Osaka; Yuji Takagi, Kadoma, and Yasushi Azumatani, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 128,178, Dec. 3, 1987, abandoned. This application Dec. 21, 1989, Ser. No. 465,542

Claims priority, application Japan, Dec. 19, 1986, 61-304272; Dec. 19, 1986, 61-304273

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—54 **11 Claims**



1. An optical information processing system comprising an optical disk, an optical disk drive and a disk controller, said disk defining thereon a plurality of tracks divided into a plurality of sectors and being adapted to record and output data from said tracks to and from a host computer, said disk drive for driving said disk to enable recording and reproducing of data on said tracks by selective irradiation of a laser beam on said tracks of the disk, and said controller for connecting said disk drive to the host computer;

said optical disk defining a first division comprising said plurality of tracks arranged in a plurality of management blocks, each of said management blocks comprising:

a data sector portion comprising a plurality of data sectors to record data thereon;

a first alternate sectors portion comprising plural first alternate sectors to substitute for detected defective ones of said data sectors to record data therein which would otherwise be recorded in said detected defective data sectors;

said optical disk defining a second division comprising a second alternate sectors portion comprising plural second alternate sectors to substitute for detected defective ones of said data sectors to record data therein which would otherwise be recorded in detected defective sectors additional to said detected defective data sectors which are substituted by said first alternate sectors of said management blocks; and

each of said management blocks further including a mapping sectors portion comprising at least two mapping sectors recording alternate sector address management information relating to an address relationship between detected defective data sectors and substituted ones of said first and second alternate sectors storing data of the defective sectors;

said controller comprising:

means for recording and reproducing data on and from said data sectors, said first alternate sectors and said second alternate sectors;

error correction means for adding an error correction detection code to data to be recorded on said disk and for detecting and correcting errors in reproduced data;

means for detecting defective ones of said data sectors,

memory means for storing said alternate sector address management information, and

sector substituting means for performing a defective-data substitution operation by substituting a particular detected defected data sector with a corresponding one of said first and second alternate sectors to enable data recording and reproducing in and from said corresponding one of said first and second alternate sectors in place of said particular detected defective data sector by referring to the alternate sector address management information stored in said memory means;

whereby said controller is adapted to, prior to the data recording/reproducing operation with respect to the data sectors of a particular current one of said management blocks, read said alternate sector address management information from its mapping sectors portion, store said read management information in said memory means, and thereafter effect said data recording/reproducing operation with respect to the data sectors of said current one of said management blocks while enabling said sector substituting means by referring to the management information stored in said memory means.

4,984,231

OPTICAL INFORMATION PHASE CHANGE RECORDING MEDIUM HAVING DOUBLE PROTECTIVE LAYER

Hiroshi Yasuoka; Norio Murase, both of Kokubunji; Motoyasu Terao, Tokyo; Tetsuya Nishida, Koganei; Keikichi Andoo, Musashino, and Masahiro Ojima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 147,362

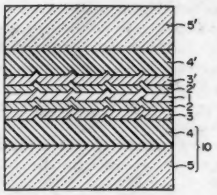
Claims priority, application Japan, Jan. 23, 1987, 62-12357

Int. Cl.[5] G11B *7/24*

U.S. Cl. 369—275.1 **20 Claims**

1. An optical information recording carrier, which comprises a recording film of phase change type and an organic member having concave or convex grooves or indents, a first

transparent film having a low thermal conductivity provided proximate to the recording film and a second transparent film having a higher thermal conductivity than that of the first



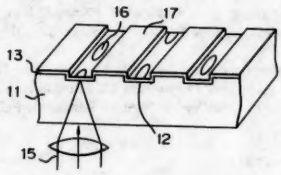
transparent film being provided farther away from the recording film than the first transparent film, the first and second transparent films being provided by lamination between the recording film and the organic member.

4,984,232

COMPATIBLE OPTICAL DISK

Kenichi Utsumi, Zama; Nagaaki Koshino, Yokohama; Yasuyuki Goto, Atsugi; Iwao Tsugawa, Machida, and Masahiro Nakada, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,288
Claims priority, application Japan, Apr. 8, 1988, 63-085161
Int. Cl.[5] G11B 7/26
U.S. Cl. 369—277 **12 Claims**



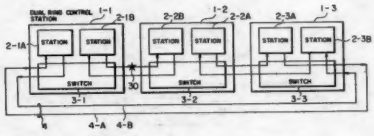
1. A compatible optical disk in which a writing or rewriting of information is possible, said optical disk comprising a transparent substrate (11), a light beam-guiding groove (12) formed on one surface of the substrate and a recording film (13) or a multi-layer film including a recording film, formed on the groove-formed surface of the substrate, wherein information is recorded, erased or reproduced by irradiation of light beams along a trough portion (12) or crest portion (17) of said groove; a reflectivity of the recording film (13) is changed by an irradiation of light to record or erase information; a reflectivity of the optical disk observed from the side of the transparent substrate is lower than 50% in an unrecorded state and the reflectivity is increased when a recorded state is produced by an irradiation of light; where the reflectivity of the crest portion (17) is enhanced and the reflectivity is locally increased by recording information along the trough portion (12), where the average reflectivity of the information-recorded trough portion (12) is not higher than the reflectivity of the crest portion (17) between the troughs, when the reflectivity is observed by an optical head; or wherein when the reflectivity of the trough portion (12) is enhanced and the reflectivity is locally increased by recording information along the crest portion (17), the average reflectivity of the information-recorded crest portion (17) is not higher than the reflectivity of the trough portion (12) between the crests, when the reflectivity is observed by the optical head.

4,984,233

METHOD AND APPARATUS FOR TESTING STATION ADDRESS IN NETWORK

Susumu Nakayashiki, Sagamihara; Jiro Kashio, Kawasaki; Hisashi Matsumura, Odawara; Hiroyuki Wada, Hadano; Yoshihito Sako, Hadano; Fumiaki Matsuura, Hadano, and Ihei Kajiya, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Software Engineering Co., Ltd, Yokohama, both of, Japan

Filed Feb. 13, 1990, Ser. No. 479,359
Claims priority, application Japan, Feb. 15, 1989, 1-033622
Int. Cl.[5] H04J 3/14
U.S. Cl. 370—16 **11 Claims**



1. A network system constructed of a plurality of stations each having a single address and connected via at least one transmission line to each other, said each of stations comprising:

first means for storing flag information indicating whether or not a duplicated address test is performed so as to detect whether or not other stations having the same address as that of a self-station already exist in said network;

second means for resetting the flag information stored in said first means at a predetermined timing;

third means for sending out a single signal frame for said duplicated address test to said transmission line in case that the flag information stored in said first means has been reset, said signal frame containing an address of a station which has transmitted said signal frame, and a field for discriminating whether or not the duplicated address is present; and,

fourth means for writing information indicative of the existence of the duplicated address into said signal frame when a signal frame for the duplicated address test is received from another station, and if an address contained in said signal frame is coincident with the address of the self-station, and thereafter relaying said information to a succeeding station; for bypassing the self-station from said transmission line when the signal frame for the duplicated address test is received from the self-station and if information representative of the existence of the duplicated address is contained in said signal frame, and for writing flag information indicative of an end of said duplicated address test into said first means if not.

4,984,234

TIME-DIVISION SWITCHING SYSTEM

Gérard Vergnaud, Franconville, and Gérard Thomas, Eragny Sur Oise, both of France, assignors to Societe Anonyme Dite: Telic Alcatel, Paris, France

Filed Jan. 19, 1989, Ser. No. 299,152
Claims priority, application France, Jan. 22, 1988, 88 00697
Int. Cl.[5] H04Q 11/04
U.S. Cl. 370—58.1 **9 Claims**

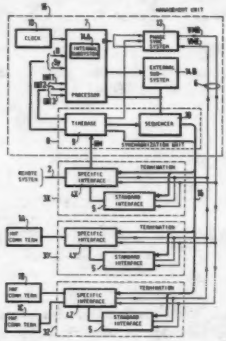
1. A time-division switching system for selective on-demand exchange of information between terminations adapted to be connected to telecommunications terminals either directly or through links to other, identical or at least compatible switching systems, said time division switching system comprising

said terminations for converting said information into digitized speech and signalling bits,

a timebase for synchronizing its operation, and

programmed management logic incorporating a processor

and memory which is directly addressable by said processor and which is adapted to store, in memory space directly addressable by said processor, programs and all data including said digitized speech and signalling bits and to provide storage in said directly addressable memory space for all control operations and in particular for the



switching of information exchanged through the terminations, and a bus link functioning in real time by which said terminations are connected in parallel to said processor, wherein said terminations convert signals from said terminals or links with other systems into a digital form acceptable by said processor and transmissible by said bus link and vice versa.

4,984,235

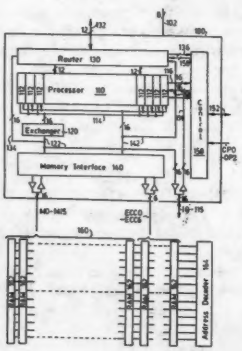
METHOD AND APPARATUS FOR ROUTING MESSAGE PACKETS AND RECORDING THE ROOFING SEQUENCE

W. Daniel Hillis, Brookline; Brewster Kahle, Somerville; George G. Robertson, Marblehead, and Guy L. Steele, Jr., Lexington, all of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Filed Apr. 27, 1987, Ser. No. 43,126

Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—60 **19 Claims**



1. In a parallel computer comprising a plurality of processors and an N-dimensional interconnection network having in each of N dimensions communication lines over which the processors communicate with one another, N being equal to or greater than two, means for routing addressed message packets across said communication lines between a first processor to a second processor comprising at each of a plurality of nodes in said network:

a memory for storing message packets enroute from a source processor to a destination processor,

means for selectively connecting a message packet that is addressed for routing to a communication line that is connected to a node between said source and said destination processors, said connection being made in response to address information in said message packet,

means for selectively inserting into a queue at a source processor a message packet addressed for routing to a destination processor,

means for selectively removing from a memory at a destination processor a message packet addressed to said destination processor,

means for recording operating states of said means for selectively connecting, said means for selectively inserting and said means for selectively removing at successive stages of their operation in the process of routing the message packet from a first processor to a second processor, and

means for reestablishing said operating states of said means for selectively connecting, said means for selectively inserting, and said means for selectively removing in a sequence that is the reverse of that used to route the message packet from the first processor to the second processor, whereby a message packet can be routed from said second processor back to said first processor.

4,984,236

CIRCUIT ARRANGEMENT FOR USE IN THE TIME DIVISION MULTIPLEXED SIGNALLING SYSTEM

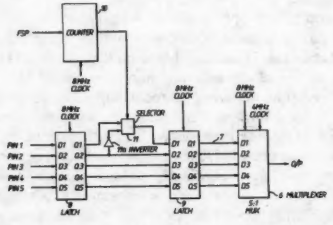
Geoffrey Chopping, and Andrew K. Borland, both of Dorset, England, assignors to Plessey company plc, Ilford, United Kingdom

Continuation-in-part of Ser. No. 146,880, Jan. 22, 1988, abandoned. This application Jan. 13, 1989, Ser. No. 296,726

Claims priority, application United Kingdom, Feb. 20, 1987, 8703983

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—100.1 **3 Claims**

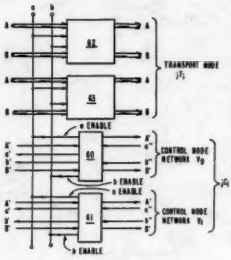


1. A circuit arrangement for use in a time division multiplexed (TDM) signalling system of the kind transmitting frames of data each such frame comprising data bits from n data streams interleaved in turn, wherein the arrangement comprises a first latch which receives a plurality of data streams each on a respective input of the first latch, a second latch having a respective input connected to a respective output of the first latch, and a first input being controlled by a selector to selectively pass a first output from the first latch to a first input of the second latch, or the inverse of a second output of the first latch to the first input of the second latch and a multiplexer arranged to have a respective input connected to a respective output of the second latch.

4,984,237
MULTISTAGE NETWORK WITH DISTRIBUTED PIPELINED CONTROL

Peter A. Franaszek, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1989, Ser. No. 373,860
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—60 9 Claims



1. A multistage communication network with distributed pipeline control comprising:

a first network comprising a first array of N×M nodes jT, j=1 to N×M, said first array having a topology defining N input ports and M output ports, said output ports being connected to corresponding output buses and each of said input ports being selectively connectable to any one of said output buses via said output ports;

each of said nodes jT comprising a transport node of one or more crossbar switches having input lines, output lines and at least one enable line, said input and output lines being connected to adjacent nodes in said first array;

a second network comprising a plurality of subnetworks or arrays V_i, i=(n) modulo Q, said second subnetworks or arrays having N×M nodes jC_i, said second subnetworks or arrays having the same topology as said first network; and

said nodes Jc_i comprising at least two control nodes V_0 and V_1 connected to said enable line and controlling transmission of a packet of data through said nodes jT during at least two different time slots, said control nodes each having input and output disable lines and input and output control lines connected to adjacent nodes in said network, whereby a collision occurring in one of said nodes jT during one time slot will not affect a message packet at said node during another time slot.

4,984,238
METHOD AND APPARATUS FOR FRAME SYNCHRONIZATION

Toshiaki Watanabe, Kawasaki; Kazuo Iguchi, Yokohama, and Tetsuo Soejima, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 8, 1989, Ser. No. 320,588
Claims priority, application Japan, Mar. 14, 1988, 63-060143
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—105.1 15 Claims

1. A frame synchronization method comprising the steps of:

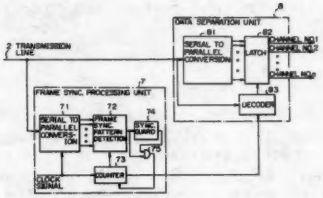
(a) receiving serial signals including frame synchronization signals and frame identification signals transmitted serially through a transmission line in n-multiplexed form;

(b) converting said received serial signals to parallel signals;

(c) latching said parallel signals;

(d) carrying out synchronization detection of a frame synchronization signal using one of n-multiplexed frame synchronization signals derived from a sequence of frame synchronization signals each delayed by one bit from the preceding frame synchronization signal;

(e) carrying out synchronization confirmation as a guard of synchronization by detecting a repetition of said synchronization detections of said frame synchronization signal;



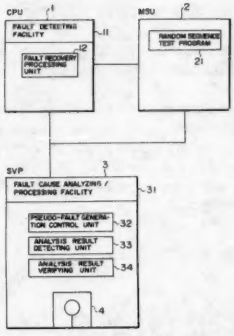
(f) confirming the subsequent frame identification signal based on said synchronization confirmation; and

(g) carrying out separation of said received multiplexed signals into a plurality of channels based on said synchronization confirmed frame synchronization signal and said confirmed frame identification signal.

4,984,239
AUTOMATIC VERIFICATION SYSTEM FOR MAINTENANCE/DIAGNOSIS FACILITY IN COMPUTER SYSTEM

Kaoru Suzuki; Mamoru Kaneko, and Matsukichi Kanari, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Electronics Service Co., Ltd., Kanagawa, both of, Japan

Filed Jan. 4, 1989, Ser. No. 293,492
Claims priority, application Japan, Jan. 13, 1988, 63-5366
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—3 14 Claims



1. An automatic verification system for a maintenance/diagnosis facility in a computer system comprising a host computer having a fault detecting facility and a fault recovery processing unit for performing a fault recovery processing when a pseudo-fault is generated, and a service processor comprising a fault cause analyzing/processing facility and a fault cause analysis data storing file,

said service processor further comprising a pseudo-fault generation control unit for scanning in error data used to generate a pseudo-machine check for said host computer and for controlling a pseudo-fault generating memory address, an analysis result detecting unit for retrieving and extracting results of an analysis conducted by said fault cause analyzing/processing facility from said fault cause analysis data storing file, and an analysis result verifying

unit for comparing the analysis results with an expected value to perform verification, and

said computer system further comprising means for effecting the generation of the pseudo-fault by a multi-run of a verification program and a random sequence test program so that analysis data on the generated pseudo-fault is evaluated to automatically verify said fault detecting facility and said fault cause analyzing/processing facility.

4,984,240

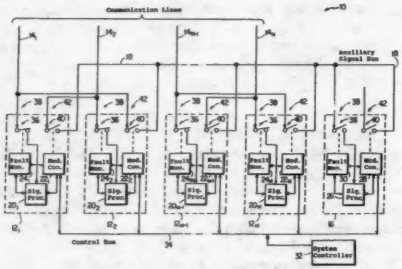
DISTRIBUTED SWITCHING ARCHITECTURE FOR COMMUNICATION MODULE REDUNDANCY

Joseph Keren-Zvi, Sharon, and Wayne M. King, Canton, both of Mass., assignors to Codex Corporation, Mansfield, Mass.

Filed Dec. 22, 1988, Ser. No. 288,788

Int. Cl.[5] G06F *11/20*

U.S. Cl. 371—8.2 **21 Claims**



1. In a communication system of the kind in which a plurality of primary communications modules receive signals on a corresponding plurality of communication lines, apparatus for providing redundancy in case of a failure of one of said primary modules, comprising

a spare communications module for receiving signals from the communication line corresponding to a filed primary module, and

a plurality of partner modules assigned to said plurality of primary modules, each partner module comprising circuitry for coupling signals from the communication line of the primary module to which the partner module is assigned to said spare module in case of failure of said primary module.

4,984,241

TIGHTLY SYNCHRONIZED FAULT TOLERANT CLOCK

Tuong K. Truong, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 23, 1989, Ser. No. 301,327

Int. Cl.[5] G06F *11/18*

U.S. Cl. 371—36 **16 Claims**

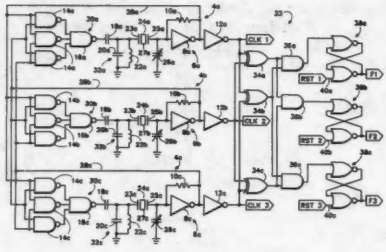
1. A fault tolerant clock comprising:

a plurality of substantially identical modules, each module having an output terminal and comprising:

an oscillator having an amplifier with an input terminal, an output terminal and a feedback path,

the feedback path comprising a majority voter network having a plurality of input terminals coupled to the output terminals of the modules respectively, and an output terminal,

a variable trimming capacitor connected between the input terminal of said amplifier and a reference potential level, and



a resonator connected between the output terminal of said majority voter network and the input terminal of said amplifier.

4,984,242

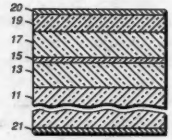
GAAS/ALGAAS HETEROSTRUCTURE LASER CONTAINING INDIUM

Donald R. Scifres; David F. Welch, both of San Jose; John Endriz, Belmont, and William Streifer, Palo Alto, all of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Filed Sep. 18, 1989, Ser. No. 408,675

Int. Cl.[5] H01S *3/19*; H01L *33/00*

U.S. Cl. 372—45 **26 Claims**



1. In a semiconductor laser, a structure comprising,

a GaAs substrate, and

a multilayer GaAs/AlGaAs heterostructure disposed on said substrate, said heterostructure including an active region of at least one layer, at least one cladding layer of said heterostructure containing indium.

4,984,243

SEMICONDUCTOR LASER DEVICE

Hitoshi Kagawa, and Tetsuya Yagi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 1, 1989, Ser. No. 387,767

Claims priority, application Japan, Apr. 6, 1989, 1-88708

Int. Cl.[5] H01S *3/19, 3/08*

U.S. Cl. 372—46 **2 Claims**

1. A semiconductor laser device comprising:

a first electrode;

a first conductivity-type GaAs substrate on which said first electrode is disposed;

a first conductivity-type $Al_xGa_{(1-x)}As$ first cladding layer disposed on said substrate opposite said first electrode;

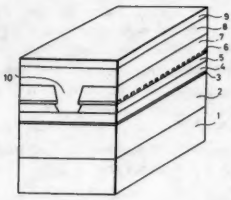
a $Al_yGa_{(1-y)}As$ active layer disposed on said first cladding layer;

a second conductivity-type $Al_xGa_{(1-x)}As$ second cladding layer disposed on said active layer;

a GaAs first current blocking layer disposed on said second cladding layer, said first current blocking layer having a

groove extending in length in a resonator direction, extending in depth to said second cladding layer, and changing periodically in width transverse to the length and depth;

a $Al_zGa_{(1-z)}As$ second current blocking layer comprising a grating having stripes extending transverse to the resonator direction and disposed on the portions of said first current blocking layer where the groove has the narrower width;



a first conductivity-type GaAs third current blocking layer disposed on said second current blocking layer and the portions of said first current blocking layer from which the stripes of said second current blocking layer are absent;

a second conductivity-type $Al_xGa_{(1-x)}As$ third cladding layer filling the groove and disposed on said third current blocking layer;

a second conductivity-type GaAs contact layer disposed on said third cladding layer; and

a second electrode disposed on said contact layer.

4,984,244

SEMICONDUCTOR LASER DEVICE

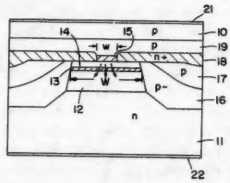
Saburo Yamamoto; Taiji Morimoto, both of Nara; Kazuaki Sasaki, Osaka; Masaki Kondo, Nara; Takahito Suyama, Tenri, and Masafumi Kondo, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 13, 1989, Ser. No. 406,903

Claims priority, application Japan, Sep. 14, 1988, 63-230990

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—461 **4 Claims**



1. In a semiconductor laser device, an apparatus comprising:

a semiconductor substrate;

a striped mesa disposed on said substrate and successively having a first cladding layer, an active layer for laser oscillation, and a second cladding layer;

a current injection layer disposed on said striped mesa;

a multi-layered crystal disposed on both sides of said striped mesa, said multi-layered crystal including first and second burying layers; and

a third burying layer disposed on both sides of said current injection layer so as to come into contact with the side walls of said current injection layer, said third burying layer being capable of absorbing laser light produced in said active layer and of preventing current from flowing through the outside of said striped mesa;

wherein said current injection layer has a width smaller than that of said striped mesa.

4,984,245

LASER OSCILLATOR DEVICE AND METHOD OF FILLING LASER GAS IN SUCH LASER OSCILLATOR DEVICE

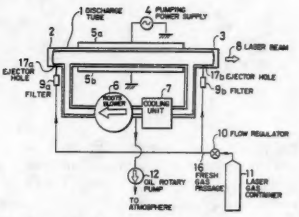
Norio Karube, Machida, Japan, assignor to Fanuc, Ltd., Yamanashi, Japan

Continuation of Ser. No. 296,058, Jan. 3, 1989, abandoned. This application Apr. 30, 1990, Ser. No. 517,516

Claims priority, application Japan, May 18, 1987, 62-120904

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—59 **8 Claims**



1. A method of filling a laser gas in a laser oscillator device for effecting laser oscillation while circulating a laser gas with a rotary blower, comprising the steps of:

providing a fresh gas passage separate from a passage of the laser gas and having filters,

providing ejector holes defined in said passage of the laser gas near optical components for ejecting a gas into the passage of the laser gas which is circulated by said blower;

connecting said fresh gas passage to said ejector holes;

removing circulated laser gas from downstream of the rotary blower and adding it to the fresh gas passage upstream of the filters; and

allowing a mixture of fresh laser gas circulated laser gas from which impurities have been removed by the filters to flow from the ejector holes away from the optical components.

4,984,246

SLAB LASER WITH OPTICAL PUMPING FROM A SOURCE HAVING A NARROW EMITTING AREA

Louis Cabaret, Dourdan; Geneviéve Girard, Jouy En Josas; Pierre Pinson, Brils Sous Forges, and Thibaut De Saxce, Palaiseau, all of France, assignors to Societe Anonyme dite : Laserdot, Paris, France

Filed Jan. 3, 1990, Ser. No. 460,494

Claims priority, application France, Jan. 3, 1989, 89 00029

Int. Cl.[5] H01S *3/09*

U.S. Cl. 372—69 **9 Claims**

1. A slab laser with optical pumping from a source having a narrow emitting area, a laser comprising:

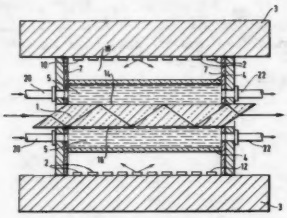
a laser slab having two main faces each having two edges which extend along a longitudinal direction and which are separated in a transverse direction by the width of said slab, said slab also having thickness in a pumping direction and sections in a transverse direction and the pumping direction, material of said slab being excited by pumping light arriving along said pumping direction to amplify light propagating along said longitudinal direction;

at least one pumping source facing at least one of said main faces of said laser slab to deliver said pumping light distributed over said longitudinal direction, each of said

sources emitting said light via an emitting area which is narrow relative to a laser plate, at least in said transverse direction; and

a reflector system suitable for reflecting said pumping light to avoid cavity losses;

wherein said emitting area of each of said pumping sources is disposed in an emission strip extending longitudinally, and facing one of said main faces at a distance from said face constituting a pumping distance d, said emission strip having two longitudinal edges; and



said reflector system includes, for each of said emission strips, two reflectors which extend longitudinally and which interconnect, along said pumping direction, the two said edges of said emission strip with respective ones of the two said edges of a same main face facing said strip, thereby forming a light duct conveying said pumping light from said emission strip to said main face over said pumping distance, said pumping distance selected to be sufficiently great to ensure that said pumping light is substantially uniform over the width of said main face.

4,984,247

DIGITAL RADIO TRANSMISSION SYSTEM FOR A CELLULAR NETWORK, USING THE SPREAD SPECTRUM METHOD

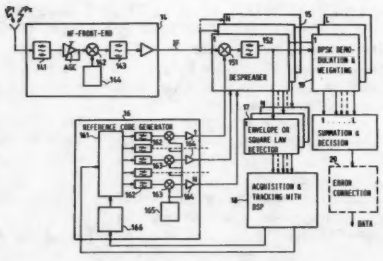
Hans Kaufmann, Gossau; Roland Kueng, Wolfhausen; Urs Grob, Goldach, and Arnold Welti, Brugg, all of Switzerland, assignors to Ascom Zelcom AG, Hombrechtikon, Switzerland

Filed Sep. 29, 1989, Ser. No. 414,253

Claims priority, application Switzerland, Sep. 29, 1988, 03628/88

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **23 Claims**



1. Digital radio transmission system for a network of cells using a phase-coded spread spectrum technique, in which spectrum spreading of a transmitted information carrying signal takes place by multiplication of the information carrying signal with an auxiliary function and despreading of a received information carrying signal takes place by using this auxiliary function, comprising several user stations within a cell, each having a transmitter, a receiver for multipath reception and a control unit and further comprising a base station with a plurality of transmitter-receivers and a base control unit, characterized in that

(a) exactly one set of several sets of spreading sequences used as the auxiliary function is allocated to each cell and an inverse of the one spreading sequence set is used as the despreading sequence;

(b) paired sequences of different sets have absolute values for normalized periodic cross-correlation functions which are less than one for all values;

(c) in sequences with a set, values for paired cross-correlation functions are minimized around a zero point of the paired cross-correlation functions;

(d) data synchronous generation of the transmitted information carrying signals take place in the base stations for all simultaneous connections; and

(e) a data clock of a received information carrying signal is sued as a data clock of a transmitted information carrying signal within a given user station.

4,984,248

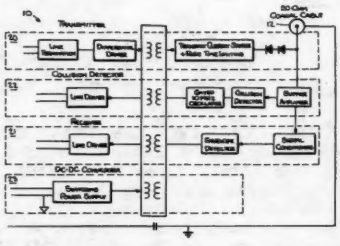
HIGH SPEED TRANSCEIVER

Hei-Tai Hong, Hsin Chu, Taiwan, assignor to Industrial Technology Research Institute, Taipei, Taiwan

Filed Aug. 19, 1988, Ser. No. 234,227

Int. Cl.[5] H04B *1/38*

U.S. Cl. 375—7 **9 Claims**



1. A data communication transceiver connected to data terminal equipment for transmitting signals of transmitted data from the data terminal equipment to a communicating medium, receiving signals from the communicating medium which are generated by another transceiver, and detecting collisions occurring on the communicating medium by simultaneous operation of another transceiver transmitting signals to the communicating medium, the transceiver comprising:

transmitter means to drive the transmitted data into the communicating medium, said transmitter means including a differential driver to sink constant current to the communicating medium, said differential driver including a pair of emitter connected transistors, and a dummy load connected to a collector of one of said pair of transmitters, said dummy load balancing the power consumption of the differential driver and the connected data terminal equipment and communicating system;

receiver means to receive data from the communicating medium;

collision detector means for detecting and reporting the collision occurrence to the data terminal equipment;

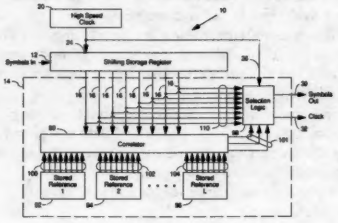
DC to DC converter means to provide power ground isolation between the data terminal equipment and the communicating medium;

pulse transformer means isolating a signal ground between the data terminal, equipment and the communicating medium.

4,984,249
METHOD AND APPARATUS FOR SYNCHRONIZING DIGITAL DATA SYMBOLS

James C. Long, and Francis M. Baker, both of Sunnyvale, Calif., assignors to First Pacific Networks, Sunnyvale, Calif.

Filed May 26, 1989, Ser. No. 358,222
Int. Cl.[5] H04L 7/04
U.S. Cl. 375—20 19 Claims



1. A method for minimizing value errors in a recovered digital symbol represented by a digital data stream received at a head end in a synchronous data communications system, said synchronous data communication system having a single high-speed sampling clock device at said head end for generating a master clock as an integral part of a first message signal, said method comprising:

sampling with a first sampler at a local node said first message signal of said synchronous data communication system to obtain a first reconstructed message with an embedded master clock;

reconstructing at said local node, from said embedded master clock, a local clock which derives bit synchronization from said master clock;

setting at said local node a bit rate derived from said master clock;

transmitting to said head end a second message with a preamble and a second embedded clock derived from said local clock;

synchronizing in bit phase, at said head end, said second embedded clock with said master clock during a preamble time of said second message, wherein a second sampler at said head end over samples the received digital data stream containing said second message in order to partition bit periods for a symbol;

selecting an optimum sample time at least near the center of said a symbol during the preamble time; and

employing said optimum sample time and said second embedded clock which has been bit phase-synchronized to said master clock to reconstruct said data symbol synchronously with said received digital data stream at said head end.

4,984,250
DC TERMINATION CIRCUIT FOR SUBSCRIBER CABLES

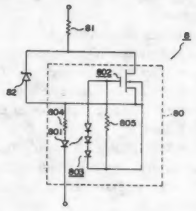
Tetsu Koyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 18, 1989, Ser. No. 298,475
Claims priority, application Japan, Jan. 19, 1988, 63-11375
Int. Cl.[5] H04B 3/00
U.S. Cl. 375—36 6 Claims

1. A DC termination circuit to be positioned between a subscriber terminal and a pair of subscriber cables in a communication system for digitally transmitting data from said subscriber terminal via said pair of subscriber cables, comprising:

termination resistor means connected to one of said paired subscriber cables;

a parallel-connected circuit including voltage-sensitive means which, connected in series to the termination resistor means, is off when the voltage does not exceed a prescribed level and is turned on when said voltage does exceed the prescribed level, and switching means connected in parallel with the voltage-sensitive means; and

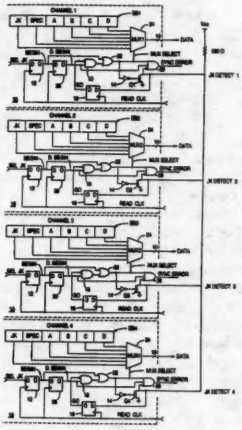


switch driving means, of which one end is connected to the parallel-connected circuit and the other end is connected to the other of said paired subscriber cables, for controlling said switching means.

4,984,251
METHOD AND APPARATUS FOR THE SYNCHRONIZATION OF A CASCADED MULTI-CHANNEL DATA TRANSMISSION

Ronald S. Perloff, Poway, Calif.; James R. Hamstra, Shorewood, Minn.; Gabriel M. Li, San Francisco, and Louise Y. Y. Yeung, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 16, 1989, Ser. No. 394,445
Int. Cl.[5] H04K 1/10
U.S. Cl. 375—38 6 Claims



2. In a data transmission network wherein a plurality of sequences of multi-bit information characters are transmitted from a transmitter station to a receiver station via a plurality of transmission channels, each sequence of multi-bit information characters to be transmitted on a corresponding transmission channel being preceded by a start delimiter, each of the plurality of transmission channels providing the multi-bit information characters transmitted on that channel to be sequentially written into sequentially accessible storage locations of an associated storage element included in the receiver, each storage element including read pointer means for accessing a storage location from which a multi-bit information character is to be retrieved, synchronization circuitry for simultaneously initiating sequential retrieval of multi-bit information charac-

ters from each of the storage elements in the same sequence in which the multi-bit information characters were written into that storage element, the synchronization circuitry comprising:

(a) a plurality of driver circuits, one such driver circuit associated with each transmission channel, each driver circuit comprising:

(i) detection means responsive to detection of a start delimiter for asserting a begin-request signal; and

(ii) start means responsive to receipt of a read-start signal for releasing the read pointer to retrieve data characters from a selected storage location of the associated storage element; and

(b) begin means responsive to simultaneous assertion of a begin-request signal by all driver circuits for simultaneously providing a read-start signal to each storage element;

whereby the read pointer of each storage element is simultaneously released to retrieve multi-bit information characters from the associated storage element.

4,984,252

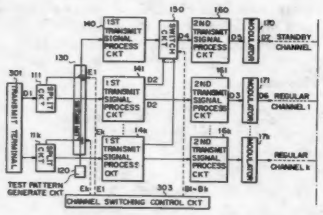
CHANNEL SWITCHING SYSTEM

Hideaki Morimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 269,395, Nov. 10, 1988. This application Oct. 10, 1989, Ser. No. 419,366

Int. Cl.[5] H04L *27/28*

U.S. Cl. 375—38 **2 Claims**



1. A channel switching system which transforms a first data signal into a frame by speed conversion, sends the frame to a regular radio channel while, if necessary, sending the frame to a standby radio channel which is in a standby state, and upon establishment of frame synchronization of the frame received over said regular and standby radio channels switches said regular and standby radio channels without any bit error by maintaining received outputs in synchronism, said system comprising:

first transmit signal processing means for constructing a first frame by inserting in the first data signal first extra bits which include at least a first frame sync bit and delivering the first frame as a second data signal;

second transmit signal processing means for constructing a second frame by inserting in the second data signal second extra bits which include at least a second frame sync bit and delivering the second frame as a third data signal to said regular radio channel;

regular modulator means for producing a modulated signal digitally modulated by the third data signal;

standby third transmit signal processing means for constructing the first frame by inserting in a sixth data signal third extra bits which include at least the first frame sync bit and delivering the first frame as a seventh data signal said sixth data signal being any one of the first data signal and a test pattern data signal;

standby fourth transmit signal processing means for constructing the second frame by inserting in a fourth data signal fourth extra bits which include at least the second frame sync bit and delivering the second frame as a fifth data signal to said standby radio channel;

standby modulator means for producing a modulated signal digitally modulated by the fifth data signal;

transmission switching means for applying any one of the second data signal and the seventh data signal as the fourth data signal to said standby fourth transmit signal processing means;

demodulator means for producing the third data signal by demodulating the regular modulated signal which has been digitally modulated by the third data signal and sent over said regular radio channel;

standby demodulator means for producing the fifth data signal by demodulating the standby modulated signal modulated by the fifth data signal and sent over said standby radio channel;

second frame synchronizing and received symbol processing means for synchronizing the third data signal and producing the second data signal by removing the second extra bits from the third data signal;

first frame synchronizing means for synchronizing the second data signal;

standby fourth synchronizing and received symbol processing means for synchronizing the fifth data signal and producing the fourth data signal by removing the fourth extra bit from the fifth data signal;

standby third frame synchronizing means for synchronizing the fourth data signal;

switching means for synchronously switching the output of the first frame synchronizing means and the output of the standby third frame synchronizing means; and

varying means for making a response speed of a phase locked loop of said standby demodulator means higher than a response speed of a phase locked loop of said standby third transmit signal processing means until the switching operation of said switching means ends.

4,984,253

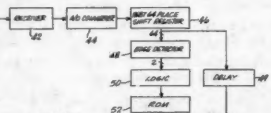
APPARATUS AND METHOD FOR PROCESSING SIMULTANEOUS RADIO FREQUENCY SIGNALS

Barry D. Trout, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 3, 1988, Ser. No. 201,795

Int. Cl.[5] H04B *1/10*; H04L *25/08*

U.S. Cl. 375—99 **19 Claims**



1. In a signal processing system an apparatus for applying weighting functions to signals within a sliding time window comprising:

an edge detector for determining when an edge of an individual pulse in a pulse train of a detected signal occurs;

a source of weighting functions;

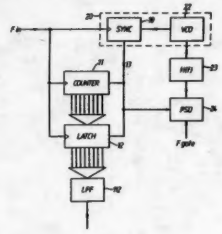
means for selecting a weighting function from the source based on the location of a leading or trailing edge of said individual pulse in said detected signal so that pulses outside the envelope of said pulse are weighted to the substantial exclusion of the envelope of said pulse for at least sometime during which the envelope of said pulse is within the sliding time window; and

means for applying the selected weighting function to the signal.

4,984,254
FREQUENCY COUNTER

Neil E. Thomas, St. Albans, United Kingdom, assignor to Marconi Instruments Limited, St. Albans, United Kingdom

Filed Mar. 7, 1989, Ser. No. 319,706
Claims priority, application United Kingdom, Apr. 21, 1988, 8809398
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—106 **14 Claims**



1. A frequency counter for counting pulses of a variable input signal using another input signal of a different, fixed frequency as a reference, said counter having input ports for receiving said variable input signal and said reference input signal, the frequency of one of said input signals being higher than that of the other of said input signals, comprising:

noise-shaping synchronising means for retiming pulses of the input signal of the lower frequency including means for selecting pulses of the input signal of the higher frequency, said retimed pulses having a fixed timing relationship with selected pulses of the input signal of the higher frequency, the action of the noise-shaping synchronising means introducing substantially less phase noise onto the lower frequency input signal at low modulation rates than would be the case with a simple synchroniser;

means responsive to said retimed pulses of lower frequency form the noise-shaping synchronising means and responsive to the higher frequency input signal for providing a data output signal representative of the ratio between the frequencies of the two input signals; and

means responsive to said data output signal for providing data at the same or a lower rate representing frequencies at modulation rates for which there is negligible synchronisation phase error.

4,984,255
EDGE TRANSITION INSENSITIVE DELAY LINE SYSTEM AND METHOD

Craig M. Davis, Santa Clara, and Gary W. Tietz, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 15, 1989, Ser. No. 436,897
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—106 **24 Claims**

1. A system for recovering a clock signal from a data signal having rising and falling data transitions, comprising:

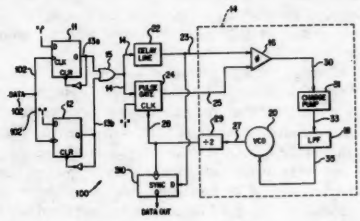
detection means for detecting data transitions in the data signal;

transition means for generating a transition signal indicative of a detected data transition, wherein the transition signal has a logic level associated therewith and wherein the logic level is a first level when a transition is detected;

delay means for delaying the transition signal by a preselected time period;

means responsive to a correction signal for generating a clock signal having clock transitions which occur in synchronization with the data transitions;

comparison means for comparing the delayed transition signal to a reference signal and for generating the correction signal indicative of a phase difference therebetween; and

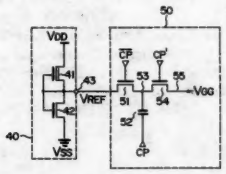


gating means responsive to the first logic level of the transition signal for supplying the clock signal to the comparison means such that the clock signal is the reference signal.

4,984,256
CHARGE TRANSFER DEVICE WITH BOOSTER CIRCIUT

Shin-ichi Imai, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 4, 1988, Ser. No. 152,382
Claims priority, application Japan, Feb. 13, 1987, 62-30747
Int. Cl.[5] G11C *19/28*; H01L *29/78*
U.S. Cl. 377—60 **7 Claims**



1. A charge transfer device comprising:

a first conductivity type semiconductor substrate;

a second conductivity type floating diffusion region formed in said semiconductor substrate;

a second conductivity type drain region formed separately from the floating diffusion region in the semiconductor substrate;

at least one insulating film formed on the semiconductor substrate;

transfer electrodes formed on the insulating film, receiving predetermined clock signals to transfer a charge, within the semiconductor substrate, toward the floating diffusion region;

a reset electrode formed on the insulation film and above a region lying between the floating diffusion region and the drain region to form a MOS transistor, to receive a reset signal for controlling the conduction and nonconduction between the floating diffusion regions and the drain region;

a voltage step-up circuit having a reference voltage generator for generating a reference voltage, and step-up means receiving the reference voltage and at least one clock pulse for sampling the reference voltage and for applying the voltage of the clock pulse to the sampled reference voltage, to apply a voltage having a level, higher than the reference voltage, to the drain region;

an output circuit having an enhancement type MOS transis-

tor electrically connected at its gate to the floating diffusion region, and a constant current source for supplying a predetermined current to the current path of the enhancement type MOS transistor, for converting the charge stored in the floating diffusion region to a signal having a voltage substantially proportional to a charge amount of the charge; and

said reference voltage generator comprising,

a first depletion type MOS transistor having second conductivity type source and drain regions formed in the semiconductor substrate in the same steps as the formation of the floating diffusion region and the drain region, and being of the same conductivity type and construction as the MOS translator formed by the reset electrode, the floating diffusion region and the drain region, the insulating film, a gate electrode formed on the insulating film in the same steps as the formation of the reset electrode, and receiving a first voltage at one end of a current path thereof; and

a first enhancement type MOS transistor connected at one end of the current path in cascade with the other end of the current path of the first depletion type MOS transistor, being of the same conductivity type as the enhancement type MOS transistor of said output circuit, for receiving the second voltage at the other end of the current path thereof, and for generating the reference voltage at the one end of the current path.

4,984,257

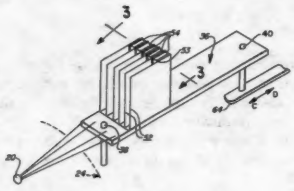
AUTOMATIC DYNAMIC FOCUSING FOR COMPUTED TOMOGRAPHY

Richard T. Bernardi, and John F. Moore, both of Lincolnshire, Ill., assignors to Bio-Imaging Research, Inc., Lincolnshire, Ill.

Continuation of Ser. No. 122,797, Nov. 19, 1987. This application Mar. 21, 1990, Ser. No. 496,679

Int. Cl.[5] G01N *23/00*

U.S. Cl. 378—13 **10 Claims**



8. A system for dynamically scanning an object under study using penetrating radiation, said system comprising means for directing a penetrating radiation source to illuminate a given area which is remote from said radiation source, detector means for collecting penetrating radiation falling on a surface in said given area, means for producing a shadow on said surface, said shadow-producing means being interposed between said penetrating radiation source and said surface, said shadow increasing or decreasing as a function of the angle of incidence of said penetrating radiation illuminating said surface, means for changing the distance between said penetrating radiation source and said detector means, and means responsive to a change in the distance between said penetrating radiation source and said detector means for, concurrently with said change in distance, orienting said detector means for collecting penetrating radiation in order to adjust said angle of incidence to reduce said shadow to substantially a minimum amount.

4,984,258

APPARATUS FOR SLIT RADIOGRAPHY COMPRISING DISCRETE, CONTROLLABLE ATTENUATION ELEMENTS COACTING WITH A SLIT DIAPHRAGM

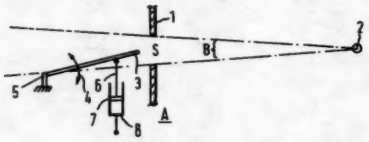
Hugo Vlasbloem, Maasland, and Simon Duinker, Bloemendaal, both of Netherlands, assignors to B.V. Optische Industries "De Oude Delft", Delft, Netherlands

Continuation of Ser. No. 713,309, Mar. 18, 1985. This application Nov. 25, 1987, Ser. No. 125,214

Claims priority, application Netherlands, Mar. 16, 1984, 8400845

Int. Cl.[5] G21K *1/00*

U.S. Cl. 378—145 **9 Claims**



1. An apparatus for slit radiography, which comprises:

an X-ray source:

an X-ray detector for collecting radiation passing through a body to be radiographed;

a slit diaphragm positioned between said X-ray source and said body for forming a substantially planar X-ray beam;

means for scanning said body with said planar X-ray beam;

a plurality of attenuating elements positioned along said slit diaphragm, each of said attenuating elements having a free end extendable into and thereby attenuating said planar X-ray beam;

control means for extending said free ends of said attenuating elements into and out of said planar X-ray beam during scanning of said body with said planar X-ray beam; and

a dampening assembly affixed to each of said attenuating elements to prevent oscillation of each of said attenuating elements as a result of extension into and out of said planar X-ray beam during scanning of said body with said X-ray beam.

4,984,259

X-RAY EXPOSURE APPARATUS

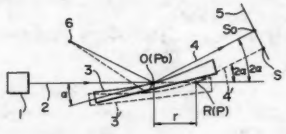
Masaaki Itou, Higashimurayama, and Shigeo Moriyama, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 253,559, Oct. 5, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 481,682

Claims priority, application Japan, Oct. 9, 1987, 62-253637

Int. Cl.[5] G21K *5/10*

U.S. Cl. 378—146 **6 Claims**



1. An X-ray exposure apparatus comprising:

an X-ray source;

a reflecting mirror having a reflecting surface for deflecting an X-ray beam radiated from said X-ray source to an object;

means for rotating said reflecting mirror having said reflecting surface about an axis of rotation, said axis of rotation being disposed apart from said reflecting surface;

said reflecting surface being configured with a shape so that an angle of grazing incidence of said X-ray beam is maintained at a constant value when said reflecting mirror rotates about said axis of rotation; and

means for scanning said object with said X-ray beam by rotating said reflecting mirror about said axis of rotation by means of said rotating means.

4,984,260

RADIATION DIAGNOSTIC DEVICE

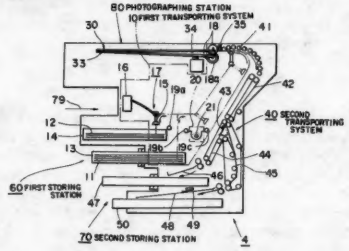
Katsuhide Koyama, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 8, 1988, Ser. No. 281,337

Claims priority, application Japan, Dec. 11, 1987, 62-311872

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—173 **8 Claims**



1. A radiation diagnostic device which includes a photographing station in which radiograph information of an object for inspection is irradiated upon a picture image record medium to make radiation photographing of the object for inspection, comprising a first storing station for storing therein first and second different picture image record media, a first transporting system for alternatively taking out one of first and second picture image record media from said first storing station and transporting the same to said photographing station, a second storing station for storing therein first and second picture image record media after photographing, and a second transporting system for transporting a first or second picture image record medium after photographing from said photographing station to said second storing station, wherein each of said first and second storing station includes a first storing means for storing first picture image record media therein, and a second storing means for storing second picture image record media therein.

4,984,261

X-RAY TUBE HEAD ASSEMBLY

Robert Maldonado, Santa Clara, Calif., and Jack H. Faude, King of Prussia, Pa., assignors to MDT Corporation, Torrance, Calif.

Filed Nov. 21, 1989, Ser. No. 440,587

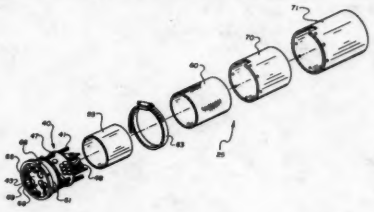
Int. Cl.[5] H05G *1/04, 1/02;* H01J *35/10*

U.S. Cl. 378—202 **17 Claims**

1. In a tube head assembly for an X-ray machine of the type wherein a high-voltage subassembly including a transformer and associated circuitry is immersed in oil within a housing, said housing being sealed against oil leakage while providing for the expansion and contraction of oil within said housing, the improvement comprising:

a mounting element, including a rigid mounting surface, constituting means for carrying the components of said high-voltage subassembly, said mounting surface being circumscribed by peripheral structure configured to couple with the open end of an enclosing element of elastomeric material;

a said enclosing element of elastomeric material positioned to enclose said high voltage subassembly within a continuous envelope, said envelope having an opening coupled in fluid-sealed relationship with said peripheral surface; said enclosing element being filled with oil; and



an X-ray-shielding housing attached to said mounting element and containing said enclosing element, the internal volume of said housing being sufficient to accommodate the expanded volume of said enclosing element when said oil is in an expanded condition due to heating.

4,984,262

DIGITAL SERVICE UNIT

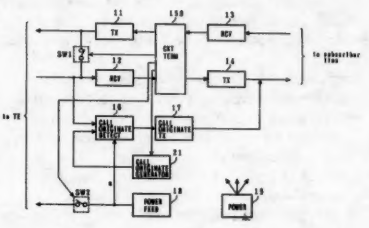
Kiyomi Kumozaki, Yokohama; Seiichi Yamano, Yokosuka, and Ryoichi Komiya, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,031

Claims priority, application Japan, Mar. 3, 1989, 1-51273

Int. Cl.[5] H04G *3/46;* H04M *1/24*

U.S. Cl. 379—5 **10 Claims**



1. A network termination device for a telephone network which connects between a terminal equipment which produces a call origination signal and a telephone central office, comprising:

first means for detecting a call origination signal and for transmitting information indicative thereof to said central office; and

testing means, for testing a link of said telephone network, including:

(a) loopback means, for receiving a transmitted signal and sending said transmitted signal back to a point from which it was produced, under command of a loopback signal;

(b) pseudo-call origination means, for producing a call origination signal, responsive to a test operation, and coupling said call origination signal to said first means; and

(c) loopback controlling means, for producing said loopback signal during a test mode only after a detection is made that said call origination signal has caused signals indicative of a call to be properly completed.

4,984,263

BREAK-IN METHOD IN A KEY SYSTEM

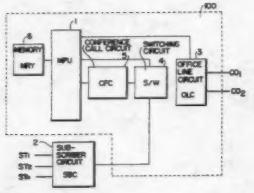
Jin-Pyo Eun, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 29, 1989, Ser. No. 373,950

Claims priority, application Rep. of Korea, Jun. 29, 1988, 1988-7931

Int. Cl.[5] H04M *1/72, 3/20, 3/56*

U.S. Cl. 379—158 6 Claims



1. A break-in device for use in a key-phone system, comprising:

microprocessor means for controlling a key system;

subscriber circuit means for interfacing a state of an extension-line subscriber with a main system;

office line circuit means for interfacing office-lines with the main systems;

switching means for, under control of said microprocessor, providing and switching extension-line subscribers;

conference-call circuit means for providing telephone subscribers with conference-call operation by providing a plurality of conference-call circuits under control of said microprocessor; and

memory means for reading and writing data under control of said microprocessor, and storing current call states of each of said extension-line subscribers;

whereby said microprocessor, in response to a break-in key input;

confirms after reception of said break-in key input, whether a current call by a first party is in a normal-call state when a call is made from an attendant telephone to the first party while a telephone line used by the first party is in a busy state;

executes an error service when the current call is not in a normal-call state;

determines from said memory means whether one of said conference call circuits is not in current use;

controls said conference call circuit means and said switching means to designate one of said conference-call circuits as an allocated circuit for a first one of said extension-line subscribers when said current call is in a normal-call state;

intervenes into a break-in state by breaking into a call between the first party and a second party with a conference-call connecting said first one of said extension-line subscribers with said first party and said second party through the allocated circuit;

checks when the attendant telephone is in a hang-on state, whether a reserved subscriber is present, breaks into the present conference-call state when the reserved subscriber is present, and returns both the attendant telephone and reserved subscriber to a normal-call state when the reserved subscriber is present; and

checks for break-in key input when the attendant telephone is not in a hang-on state, and upon reception of break-in key input, returns the other party's call to the previous normal-call state, and if there is no break-in key, and checks continuously the attendant hang-on state during an absence of break-in key input.

4,984,264

CALL ADMISSION CONTROL METHOD AND CELL FLOW MONITORING METHOD IN THE SAME METHOD

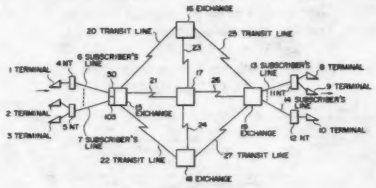
Yasuhiro Katsube, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1990, Ser. No. 482,018

Claims priority, application Japan, Feb. 22, 1989, 1-40199

Int. Cl.[5] H04M *3/36*

U.S. Cl. 379—197 3 Claims



3. A cell flow monitoring method for monitoring cell flows transmitted from terminals during communication by counting the cell flows in time units $\Delta t(i)$ (i is a positive integer 1, 2, . . . , n) having a plurality of lengths, and if the cell flow within the time unit $\Delta t(i)$ exceeds a traffic characteristic value a(j,i) of said terminals grasped beforehand by a network, for immediately determining "violation" and performing a regulation sequence.

4,984,265

DEVICE FOR FORMING THE HANDS-FREE FUNCTION IN A TELEPHONE SET, ASSOCIATING THE GAIN SWITCHING AND ECHO SUPPRESSION FUNCTIONS

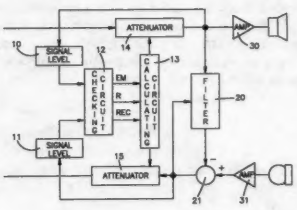
Jean-Louis Connan, 39 Residence de la Plage Tresmeur, 22560 Trebeurden; Jean-Yves Huiban, Ker Squivel Izellan Plou-Lech, and Serge Pinaud, Kerbalanec Servel, both of 22300 Lannion, all of France

Continuation of Ser. No. 159,176, Feb. 23, 1988, abandoned. This application Nov. 3, 1989, Ser. No. 432,332

Claims priority, application France, Mar. 3, 1987, 87 02850

Int. Cl.[5] H04M *9/08, 3/40*

U.S. Cl. 379—390 5 Claims



1. Device for performing the hands-free function in a telephone set comprising:

a reception channel with a first variable attenuator having a first attenuation, a control input for controlling said first attenuation, a signal output delivering a reception signal having a level, and a loudspeaker connected to said output of said first variable attenuator;

an emission channel with a microphone delivering an emission signal having a level, a second variable attenuator having a second attenuation, and a control input for controlling said second attenuation;

an echo canceller consisting of a filter having a signal said loudspeaker, a control input and an output, and a sub-

tracter having a first input connected to said microphone and a second input connected to said output of said filter and having an output connected to said second variable attenuator, said echo canceller having a gain and said filter having adaptable coefficients;

a first circuit for measuring the level of the reception signal present on said reception channel;

a second circuit for measuring the level of the emission signal present on said emission channel;

a checking circuit having two inputs connected to said first and second circuits and having outputs, said checking circuit delivering on one of said outputs a triggering signal when the said first circuit measures a level exceeding a predetermined threshold;

a switch having a control input connected to one output of said checking circuit and receiving therethrough said triggering signal, a signal input connected at the output of said subtracter and signal output connected to said control input of said filter, said control input of said filter receiving through said switch a signal delivered by said output of said subtracter and adapting therefrom its coefficients; and

a calculating circuit having inputs connected to said outputs of said checking circuit and having a first output connected to said control input of said first variable attenuator and a second output connected to said control input of said second variable attenuator, the total of said first and second attenuations of said first and second variable attenuators being equal to $(A-G)$ when said emission signal is present and when none said emission and reception signals is present, and is equal to $A-(G+g)$ when said reception signal is present, wherein G is the gain of said echo canceller when said reception signal is absent and $(G+g)$ is the gain of said echo canceller when said reception signal is present, wherein A is the total of said first and second attenuations necessary for obtaining stability of the device in the absence of said echo canceller.

4,984,266

SUBSCRIBER LINE CARD ARRANGEMENT

Robert Smith, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 48,094, May 5, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 312,378

Claims priority, application United Kingdom, Sep. 5, 1985, 8522069

Int. Cl.[5] H04J *3/04*

U.S. Cl. 379—399 **10 Claims**

1. A subscriber line card arrangement for use in a central office or PABX with a predetermined number of groups of multiple subscriber lines, said arrangement comprising:

analog circuit means coupled to each group of multiple subscriber lines including a relatively high voltage portion for interfacing each group of the multiple subscriber lines, and a relatively low voltage portion for performing predetermined analog functions including over-sampled analog-to-digital and digital-to-analog conversion; and

a single digital signal processor coupled to the analog circuit means for selectively communicating digital signals with each of the subscriber lines and which is time shared for processing transmitted and received digital signals for each of the groups of multiple subscriber lines, said processing by the single digital signal processor including selectively controlling frequency, two-wire impedance simulation, hybrid balance and data format of the digital signals, thereby avoiding circuitry associated with each subscriber line for implementing said signal processing.

4,984,267

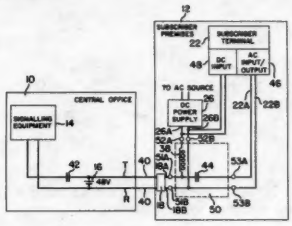
BACKUP POWER SUPPLY AT SUBSCRIBER TERMINAL

Edgar Martinez, White Plains, N.Y., assignor to Nynex Corporation, New York, N.Y.

Filed Jan. 29, 1990, Ser. No. 471,378

Int. Cl.[5] H04M *19/08*

U.S. Cl. 379—413 **13 Claims**



1. Apparatus for use with a telephone subscriber premises, the premises being adapted to be connected to tip and ring telephone lines and including a subscriber terminal connected via signal lines to said tip and ring lines and a supply for supplying DC power over supply lines to the subscriber terminal, the apparatus comprising:

a first set of terminals adapted to be connected to the tip and ring lines;

a second set of terminals adapted to be connected to the supply lines;

a third set of terminals adapted to be connected to the signal lines;

and means interconnecting said first, second and third sets of terminals such that DC signals at the first and second sets of terminals are permitted to be coupled to the second and first sets of terminals, respectively, and inhibited from being coupled to the third set of terminals and such that AC signals at the first and third sets of terminals are permitted to be coupled to third and first sets of terminals, respectively, and inhibited from being coupled to the second set of terminals.

4,984,268

TELEPHONE HANDSET CONSTRUCTION

Reed S. Brown; Alex M. Brzezinski, both of Indianapolis, Ind.; Tinyee Jue, Shreveport; William L. Woods, Jr., Keithville, both of La., and Robert S. Zieles, Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 21, 1988, Ser. No. 274,219

Int. Cl.[5] H04M *1/04*

U.S. Cl. 379—433 **17 Claims**

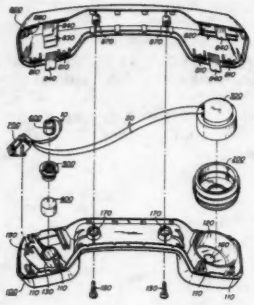
1. A telephone handset comprising:

a lower housing member having a first cylindrically-shaped cavity of uniform diameter throughout, open at one end for receiving a transducer and having a pattern of holes at the other end to enable the passage of audible sounds, said cavity including smooth, vertical walls;

a receiver transducer, cylindrically-shaped and adapted to convert electrical signals into audible sounds, the receiver transducer including at least one hole in a front surface thereof to enable the passage of said audible sounds;

a first flexible tubular gasket surrounding the receiver transducer around its circumference, the combined first tubular gasket and receiver transducer having an outer diameter sized to: (i) fit into the first cylindrically-shaped cavity of the lower housing member, (ii) be frictionally held

therein, (iii) form a seal between the receiver and said first cavity; and



an upper housing member adapted to mate with the lower housing member to form a handset housing.

4,984,269

TELEPHONE BRACKET, IN PARTICULAR FOR VEHICLES

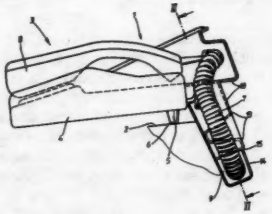
Horst Holzhauer, Schellbronn; Eberhard Löffler, Stuttgart, and Rudi Kneib, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 442,297

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843817

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—454 3 Claims



1. A telephone bracket which has a reception recess for a support plinth on which a hand receiver can be fastened, a spiral cable connected to the hand receiver being guided around a cable deflection member, wherein a cable storage container adjoins the reception recess and has a cavity, which extends downwards towards a vehicle floor and into which the cable deflection member is inserted from above, and wherein securing means are provided for securing the cable deflection member for quick removal.

4,984,270

METHOD AND SYSTEM FOR TRANSMISSION OF FINANCIAL DATA

Jack LaBounty, Bellevue, Wash., assignor to The Exchange System, Bellevue, Wash.

Filed Jun. 19, 1987, Ser. No. 64,169

Int. Cl.[5] H04K *1/00*

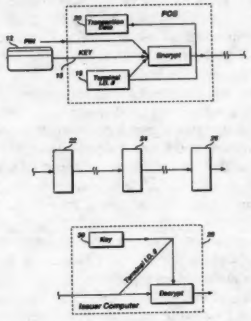
U.S. Cl. 380—24 5 Claims

1. A method of securing electronic data relating to a customer-initiated financial transaction or the like for transmission from a transaction location to a remote receiving location, comprising:

issuing the customer a financial transaction identification card having an issuer security key encoded thereon, the issuer security key corresponding to the remote receiving location;

storing the issuer security key at the remote receiving location;

at the time of a financial transaction, reading the issuer security key at the transaction location from the financial transaction identification card;



at the transaction location, encrypting preselected data relating to the financial transaction using an encryption algorithm and the issuer security key as the encryption key;

transmitting data relating to the financial transaction, including the encrypted data, to the remote receiving location; and

decrypting the encrypted data at the remote location using the issuer security key stored at the remote location.

4,984,271

CIPHER SYSTEM WITH CLOSED CIPHER PROCEDURE

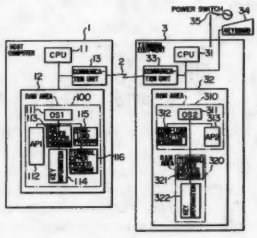
Kenjiro Goto, Atsugi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 188,339

Claims priority, application Japan, May 11, 1987, 62-112566

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—25 10 Claims



1. A cipher system for performing an enciphering and deciphering procedure of communication between host computers and terminal eqiupments while keeping the procedure secret, comprising:

a host computer having a first volatile storage (RAM AREA **100**) for storing programs including a cipher process program (**113**) to be used at the host computer and a cipher process program (**116**) to be used at the terminal equipment and preparation means coupled to said first volatile storage and including a processor (**11**) for preparing (or updating) the cipher process program for terminal equip-

ment for allowing downloading of non-fixed cipher process program; and

at least one terminal equipment connected to said host computer via a communication line, said at least one terminal equipment comprising a second volatile storage (RAM AREA 320) for storing program including said terminal equipment cipher process program and request means (ROM AREA 310) for requesting said terminal equipment cipher process program from said host computer in response to turning-on of the power of said at least one terminal equipment;

in which said at least one terminal equipment requests said terminal equipment cipher process program from said host computer immediately upon turning-on of the power of said at least one terminal equipment, said host computer sends said terminal equipment cipher process program prepared in said volatile storage of said host computer to said at least one terminal equipment in response to said request to thereby download said terminal equipment cipher process program to be stored in said volatile storage of said at least one terminal equipment, and enciphering and deciphering during communication between said at least one terminal and said host computer are performed at said at least one terminal equipment and at said host computer using said host computer cipher process program and said terminal equipment cipher process program, respectively.

4,984,272

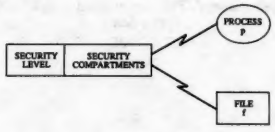
SECURE FILE HANDLING IN A COMPUTER OPERATING SYSTEM

M. Douglas McIlroy, Bernardsville, and James A. Reeds, New Providence, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1988, Ser. No. 277,630

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—25 **13 Claims**



1. A method of administering secure access to files of a computer system in which at least two different security levels are used to limit access to files and processes, comprising:

(a) associating a first security label defining one of said security levels with a file,

(b) associating a second security label defining one of said security levels with a process,

(c) comparing the first security label to the second security label in response to an attempt by the process to write the file,

(d) dynamically raising the security level of the file if the security level of the file does not dominate the security level of the process, characterized by,

(e) setting an indicator associated with this process and with this file to a first state representing that the process may subsequently write the file before performing step (c),

(f) setting an indicator associated with every other process that is presently capable of processing this file to a second state representing that the file may not be read by other processes if the security label is changed in step (d), and

(g) omitting steps (c) through (f) on subsequent write attempts of the file by a process when the indicator associated with the process-file pair is set to the first state.

4,984,273

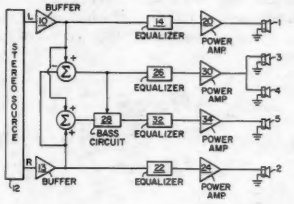
ENHANCING BASS

J. Richard Aylward, W. Newton; Timothy Holl, Medway, and William J. Keezer, Sherborn, all of Mass., assignors to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 274,381, Nov. 21, 1988. This application Aug. 31, 1989, Ser. No. 401,998

Int. Cl.[5] H04S *1/00*

U.S. Cl. 381—1 **1 Claim**



1. In a multichannel audio system, apparatus for improving bass comprising,

a plurality of upper frequency channels for radiating upper frequency sound including L and R signals, an L-R signal and an R-L signal,

a lesser number of bass channels for radiating a sound signal characterized by spectral components in the bass frequency range,

detection circuitry providing detected signals representative of the contemporary amplitude of the L-R and R-L signals in the upper frequency channels and said L signal+said R signal,

a processing circuit for processing the detected signals to provide a bass gain signal,

and a gain controller responsive to the bass gain signal for controlling the bass channel gain so that the perceived frequency response of the overall system comprising said upper frequency channels and said lesser number of bass channels remains substantially constant in the presence of variable signal levels in the different upper frequency channels,

said processing circuit comprising,

a first circuit for receiving a first detected signal representative of the magnitude of said L signal+said R signal,

a second circuit for receiving a second detected signal representative of the magnitude of said L signal−said R signal,

a combining circuit for combining said first and second detected signals to provide said bass gain signal,

said lesser number of bass channels comprising a variable gain amplifier having an input for receiving the bass spectral components of said L signal+said R signal and an output and a gain control input,

said gain control input receiving said bass gain signal.

4,984,274

SPEECH RECOGNITION APPARATUS WITH MEANS FOR PREVENTING ERRORS DUE TO DELAY IN SPEECH RECOGNITION

Mitsuhisa Yahagi, Akishima, and Nobuyuki Tonegawa, Kawasaki, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 372,868

Claims priority, application Japan, Jul. 7, 1988, 63-90337[U]; Jul. 7, 1988, 63-90341[U]

Int. Cl.[5] G10L *7/08*

U.S. Cl. 381—43 **18 Claims**

1. A speech recognition apparatus comprising:

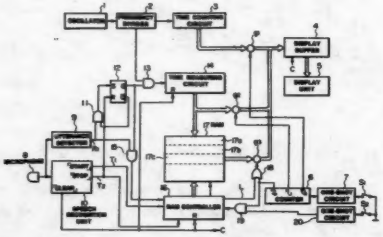
time measuring means for counting reference signals to obtain measurement time information;

display means for displaying the measurement time information obtained by the time measuring means;

speech detecting means for detecting speech externally input;

measurement start control means for supplying a measurement start signal to the time measuring means in response to the detection of speech by the speech detecting means, during an interval when the time measuring means is not performing a measurement operation for obtaining the measurement time information;

measurement time information-storing means for storing the measurement time information obtained by the time measuring means in response to the detection of speech by the



speech detecting means, during an interval when the time measuring means is performing the measurement operation under the control of the measurement start control means;

speech recognizing means for recognizing that the speech externally input to the speech detecting means indicates a stop command for stopping the measurement operation performed by the time measuring means; and

display control means for stopping the measurement operation performed by the time measuring means in response to the recognition of an indication of a stop command by the speech recognizing means, and for causing the display means to display the measurement time information stored in the measurement time information-storing means.

4,984,275

METHOD AND APPARATUS FOR SPEECH RECOGNITION

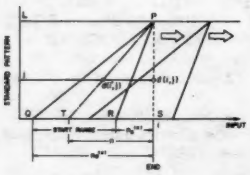
Taisuke Watanabe, Sagamihara, and Tatsuya Kimura, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 167,794, Mar. 14, 1988. This application Jul. 27, 1989, Ser. No. 385,525

Claims priority, application Japan, Mar. 13, 1987, 62-59409; Mar. 13, 1987, 62-59413; Mar. 23, 1987, 62-68436; Mar. 24, 1987, 62-69344

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—43 **3 Claims**



1. A method of speech recognition comprising the steps of:

(a) detecting presence of speech from an input signal by use of power information;

(b) setting a moment of the detection of the speech as a reference point;

(c) linearly changing the input signal during a period between the reference point and a subsequent point distant from the reference point by N (N1≦N≦N2) to a corresponding signal having a period L;

(d) extracting feature parameters from the signal having the period L;

(e) replacing the feature parameters by preset noise parameters in a portion having no speech component;

(f) predetermining standard patterns of speeches of respective preset words;

(g) calculating similarities between the extracted feature parameters containing the noise parameters and the standard patterns;

(h) comparing the calculated similarities;

(i) performing the previously-mentioned steps while varying N from N1 to N2;

(j) performing similar steps as the reference point is shifted by a unit period, and calculating similarities and comparing the similarities;

(k) detecting a duration of a speech by use of movement of the power information;

(l) determining a process end time by use of the speech duration time and a time-dependent variation in the similarities;

(m) selecting one of the words which corresponds to a maximum of the similarities obtained when the reference point reaches the process end time; and

(n) outputting the selected word as recognition result.

4,984,276

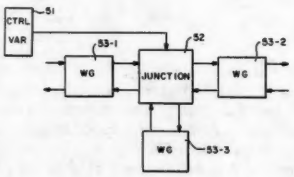
DIGITAL SIGNAL PROCESSING USING WAVEGUIDE NETWORKS

Julius O. Smith, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 275,620, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 920,701, Oct. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 859,868, May 2, 1986, abandoned. This application Sep. 27, 1989, Ser. No. 414,646

Int. Cl.[5] H03G *3/00*

U.S. Cl. 381—63 **16 Claims**



1. A digital reverberation system comprising:

a branched network including a plurality of branches formed of digital waveguides and a plurality of junctions interconnecting the waveguides, wherein:

each waveguide includes two digital delay lines running parallel to each other for propagating signals in opposite directions and having a first end and a second end, said first end having an input to a first delay line and an output from a second delay line and said second end having an input to the second delay line and an output from the first delay line, each waveguide having at least one of its ends connected to a junction;

at least one of the junctions has at least three waveguide ends connected to it and signals arriving at each junction from a particular waveguide end are partially transmitted to every other waveguide end connected to the

junction and partially reflected back to said particular waveguide end;

means for introducing losses into signals propagating in the network;

input means for providing an audio input signal to be reverberated to the network; and

output means for providing at least one reverberation output signal from the network.

4,984,277

PROTECTION ELEMENT FOR ALL-IN-THE-EAR HEARING AID

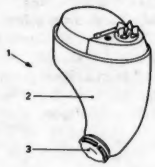
Peter N. Bisgaard, Lyngby, Denmark, and Simon Ooms, Velp, Netherlands, assignors to GN Danovox A/S, Copenhagen, Denmark

Filed Oct. 11, 1988, Ser. No. 255,717

Claims priority, application Denmark, Oct. 14, 1987, 5384/87

Int. Cl.[5] H04R *25/02*

U.S. Cl. 381—69.2 **2 Claims**



1. Protection element for the sound conduction channel on an all-in-the-ear hearing aid with a hearing aid housing arranged to suit the user's auditory canal and comprising an exchangeable filter element which prevents dirt, earwax and the like from penetrating the hearing aid's sound conduction opening, and where a sound conduction tube is provided inside the sound conduction opening, and has a free end with an annular flange for the snapping-on of the filter element which is provided with an annular collar arranged to engage with the sound conduction tube's flange, and the said filter element having at least one sharp area arranged for the removal of the filter element, and wherein the filter element comprises an annular, cylindrical part in a substantially circular masking part and a number of bridge parts between said parts, all of which are configured as a one-piece unit, and in such a way as to form a number of sound openings which extend substantially at right angles to the axial direction of the sound conduction rube when the filter element is mounted on the tube.

4,984,278

ADJUSTABLE MOUNT FOR A LOUDSPEAKER

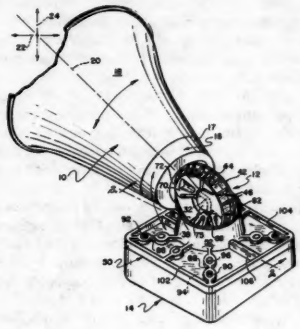
Kent H. Frye, Buchanan; Wayne J. Kooy, Galien, both of Mich., and Paul F. Fidlin, South Bend, Ind., assignors to Electro-Voice, Inc., Buchanan, Mich.

Filed Jul. 25, 1988, Ser. No. 224,116

Int. Cl.[5] H04R *1/02*

U.S. Cl. 381—205 **17 Claims**

1. A combination loudspeaker and adjustable mounting comprising, in combination: a loudspeaker having a principal axis of sound propagation; and an adjustable mount engaging the loudspeaker comprising a plate adapted to be mounted on a structure or the open side of a terminal box, the plate having one side adapted to confront the structure or terminal box and another side adapted to face outwardly from the structure, said plate having a concave part spherical first surface on the other side thereof, a first tube mounted on the plate and protruding from the first surface, a second tube mounted on the loudspeaker, a member having an aperture extending therethrough and a portion extending from the aperture with a part spherical second surface conforming to the first surface of the plate, the second surface of the member slidably engaging the first surface of the plate, said portion being provided with a slot extending through the second surface and disposed in a plane extending through the aperture, one of the tubes being disposed in the aperture of the member and the other of the tubes



being slidably disposed in the slot of the member, a first means for locking the one tube on the member, and an adjustable second means for locking the other tube on the member.

4,984,279

IMAGE PROCESSING AND MAP PRODUCTION SYSTEMS

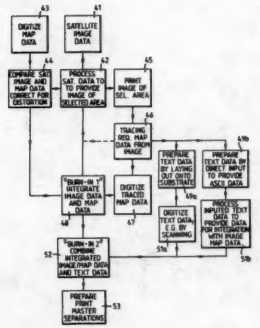
Paul D. Kidney; Andrew S. Rowlands, and William P. Mills, all of Dublin, Ireland, assignors to Emyville Enterprises Limited, Dublin, Ireland

Filed Jan. 10, 1989, Ser. No. 295,374

Claims priority, application Ireland, Jan. 4, 1989, 12/89

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—1 **17 Claims**


DIGITIZE MAP DATA
SATELLITE IMAGE DATA
COMPARE SAT. IMAGE AND MAP DATA CORRECT FOR DISTORTION
PROCESS SAT. DATA TO PROVIDE IMAGE OF SELECTED AREA
PRINT IMAGE OF SEL. AREA
TRACING REQ. MAP DATA FROM IMAGE
PREPARE TEXT DATA BY LAYING OUT ONTO SUBSTRATE
PREPARE TEXT DATA BY DIRECT INPUT TO PROVIDE ASCII DATA
"BURN-IN 1" INTEGRATE IMAGE DATA AND MAP DATA
DIGITIZE TRACED MAP DATA
DIGITIZE TEXT DATA, E.G. BY SCANNING
PROCESS INPUTTED TEXT DATA TO PROVIDE DATA FOR INTEGRATION WITH IMAGE MAP DATA
"BURN-IN 2" COMBINE INTEGRATED IMAGE/MAP DATA AND TEXT DATA
PREPARE PRINT MASTER SEPARATIONS

1. A method of making a map comprising the steps of:

(a) processing data collected by remote-sensing to provide image data usable to define a pictorial representation of a selected region, said image data consisting of a multiplicity of elements of data, and each of said elements of data containing image information,

(b) digitising a representation of geographical features within said selected region to provide feature data, said feature data consisting of a multiplicity of elements of data, and at least some of said elements of data containing feature-defining information, and

(c) integrating said image data with said feature data to provide combined data usable to define a pictorial repre-

sentation of said selected region, said combined data consisting of a multiplicity of elements of data,

wherein said image data and feature data integrating step includes

(i) establishing, for each element of image data, whether any corresponding element or elements of feature data exist,

(ii) for any element of said image data to which no element of feature data corresponds, said any element providing an element of said combined data containing only image information,

(iii) for each element of image data for which one or more corresponding elements of feature data exist, establishing for each of said one or more corresponding elements of feature data whether said each of said one or more corresponding elements of feature data contains feature-defining information,

(iv) where said each of said one or more corresponding elements of feature data contains feature-defining information, said each of said one or more corresponding elements of feature data which contains feature-defining information providing an element of said combined data incorporating information pertaining to a feature or features defined by said each of said one or more corresponding elements of feature data which contains feature-defining information, and

(v) where none of said one or more corresponding elements of feature data contains feature-defining information, said each element of image data providing an element of said combined data containing only image information.

4,984,280

BILL DISCRIMINATING APPARATUS

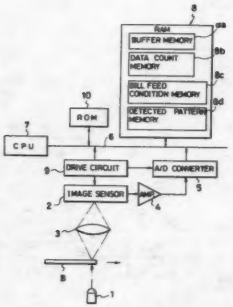
Masakazu Abe, Moriguchi, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,977

Claims priority, application Japan, Jun. 8, 1988, 63-141022; May 26, 1989, 1-134365

Int. Cl.[5] G06K *9/32*

U.S. Cl. 382—7 **3 Claims**



1. A bill discriminating apparatus having photoelectrical detecting means for scanning bills being fed along a bill feeding path with light in the direction perpendicular to the bill feeding direction and photoelectrically detecting light transmitted through or reflected by the bills and bill discriminating means for comparing a detected pattern produced based on an amount of light transmitted through or reflected by the bills detected by said photoelectrical detecting means with reference patterns and discriminating denominations, genuineness and/or condition of the bills, said bill discriminating apparatus comprising detected data storing means for temporarily storing data corresponding to at least one line of a bill photoelectrically detected by at least one scan of said photoelectrical detecting means, control means for detecting the number of said detected data for each line of the bill to be stored in said detected data storing means and detecting a condition of feeding of the bill based on the detected data of the first line of the bill to be stored in said detected data storing means, data count storing means for storing the number of the detected data corresponding to each line of the bill detected by said control means, bill feed condition storing means for storing information detected by said control means and detected pattern storing means for storing the pattern of the bill based on the detected data stored in said detected data storing means, said control means being able to write the detected data stored in said detected data on the number of the detected data corresponding to each line of the bill stored in said data count storing means and the information stored in said bill feed condition storing means so that rectangular patterns can be stored in said detected pattern storing means.

4,984,281

MAGNETIC INK CHARACTER RECOGNITION SYSTEM

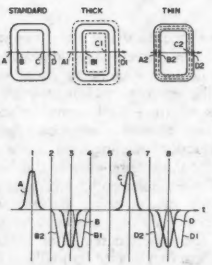
Tomohiro Matsuhashi, Tachikawa; Hideo Kamata, Kawasaki; Masami Yasuda, Chofu; Satoshi Katsoka, Fuchu; Hideyuki Inaoka, Tama, and Eiichi Watanabe, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 15, 1990, Ser. No. 493,608

Claims priority, application Japan, Mar. 16, 1989, 1-62266

Int. Cl.[5] G06K *9/18*

U.S. Cl. 382—7 **3 Claims**



1. A magnetic ink character recognition system provided in a magnetic ink character reader, comprising;

a read means (81) for detecting magnetic flux generated from each magnetic ink character separately printed at every field in a check or bill and outputting a digital signal read therefrom;

a storage means (82) operatively connected to said read means (81) for storing the digital signals output from said read means (81);

a field sort means (83) operatively connected to said storage means (82) for receiving the digital signals from said storage means (82) at every field and sorting the digital signals for each field;

a decision means (84) operatively connected to said field sort means (83) for receiving the digital signals sorted by said field sort means (83), judging thickness of the magnetic ink characters in every field, and determining a representative thickness value at every field;

a correction means (85) operatively connected to said storage means (82) and said decision means (84) for receiving the digital signals from said storage means (82) and correcting the digital signals based on decision data output from said decision means (84) for every field; and

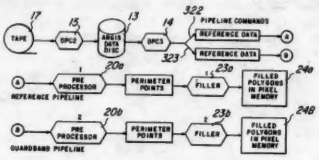
a recognition means (86) operatively connected to said correction means (85) for determining whether or not the corrected signals are readable.

4,984,282

PARALLEL PROCESSING OF REFERENCE AND GUARDBAND DATA

William G. Manns, Dallas; David A. Norwood, Richardson; Don J. Weeks, Southlake; Chyi N. Sheng, Richardson, and Anthony B. Wood, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1988, Ser. No. 173,708
Int. Cl.[5] G01N 21/00; G06K 9/00, 9/68
U.S. Cl. 382—8 5 Claims



1. A computerized method of pattern inspection, comprising the steps of:

providing a database partitioned into frames of reference data describing an ideal pattern comprised of reference polygons, each of which is completely contained within a frame of reference data;

providing a data description of guardband polygons surrounding each of the sides of the reference polygons, wherein each guardband polygon is completely contained within a frame of guardband data describing only guardband polygons;

providing at least one frame of guardband data for each frame of reference data;

providing a plurality of pipelines for expanding the frames of reference data and the frames of guardband data into bit-mapped descriptions of the reference polygons and the guardband polygons;

dividing the plurality of pipelines into a group of one or more reference pipelines and the remaining pipelines into a group of one or more guardband pipelines;

outputting entire frames of reference data to one of said group of reference pipelines; and

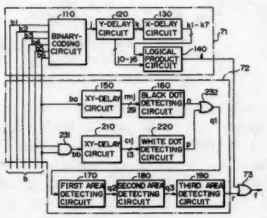
outputting entire frames of guardband data to one of said group of guardband pipelines.

4,984,283

TWO DIMENSIONAL HALF-TONE DOT DISCRIMINATION DEVICE

Yukio Sakano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 6, 1988, Ser. No. 191,139
Claims priority, application Japan, May 11, 1987, 62-113793
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—28 8 Claims



4. An image area discriminating device for discriminating whether scanned areas of an input image have been previously subjected to halftone dotting treatment or not, comprising:

first binary-coding means for binary-coding said input image along the main scanning direction and for producing a comparison of said image with a first threshold along a two-dimensional path and which comprises a two-dimensional information generator means for delaying the input image as a function of a time series sequence, along the main scanning direction and also along the subsidiary scanning direction for every picture element and for outputting digital signals relating plural picture elements and arranged to form a matrix along the main and subsidiary scanning directions concurrently;

recorded dot detector means for accepting a first binary-coded data outputted from said first binary-coding means and comparing a two-dimensional matrix pattern of said first binary-coded data with a preset recorded dot detection pattern and for outputting the result of said comparison;

second binary-coding means for binary-coding said input image along the main scanning direction and for comparing said binary-coded image with a second threshold which is different from said first threshold and which comprises a two-dimensional information generator means for delaying the input image as a function of a time series sequence, along the main scanning direction and also along the subsidiary scanning direction for every picture element and for outputting digital signals relating plural picture elements and arranged to form a matrix along the main and subsidiary scanning directions concurrently;

unrecorded dot detector means for accepting the second binary-coded data outputted by said second binary-coding means and comparing the two-dimensional matrix pattern of said second binary-coded data with a preset unrecorded dot detection pattern and for outputting the result of said comparison, said unrecorded dot detector means including an unrecorded dot detection pattern which is different from said recorded dot detection pattern in at least one of the dimensions of the patterns, the arrangement of the patterns or the number of detection conditions; and

halftone dot pattern discriminator means for receiving the output from said recorded dot detector means and the output from said unrecorded dot detector means to discriminate whether the input image information is a halftone dotted pattern.

4,984,284

IMAGE PROCESSING APPARATUS

Hisaji Masaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 677,735, Dec. 3, 1984, abandoned. This application Feb. 15, 1989, Ser. No. 311,405
Claims priority, application Japan, Dec. 9, 1983, 58-231454
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—48 7 Claims

1. An image processing apparatus comprising:

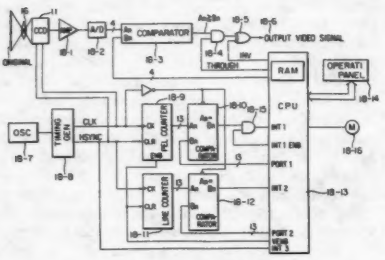
input means for entering image information signals representing a document image;

adjustable designating means for designating desired image areas of the document image, said designating means being capable of designating a first desired image area, the first image area being only a portion of the document image, and a second desired image area, the second desired image area being within the first desired image area;

image processing means for processing the image information signals entered via said input means in accordance with the area designation by said designating means, said image processing means being adapted to convert, to predetermined signals, image information signals corresponding to the portion of the first desired image area other than the second desired image area; and

forming means for forming an image on a recording sheet in accordance with the image information signals from said

image processing means, said forming means forming on the same recording sheet the document image outside the



first desired image area and the document image inside the second desired image area.

4,984,285

METHOD OF CORRECTING SHADING PHENOMENON IN OPTICAL CHARACTER READER

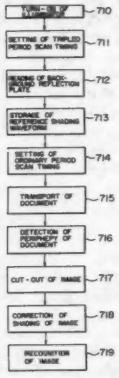
Mitsunari Kano, Seto, and Toshirou Uemura, Nagoya, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,814

Claims priority, application Japan, Aug. 26, 1987, 62-210050

Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—50 **2 Claims**


SETTING OF TRIPLED PERIOD SCAN TIMING
READING OF BACK-GROUND REFLECTION PLATE
STORAGE OF REFERENCE SHADING WAVEFORM
SETTING OF ORDINARY PERIOD SCAN TIMING
TRANSPORT OF DOCUMENT
DETECTION OF PERIPHERY OF DOCUMENT
CUT - OUT OF IMAGE
CORRECTION OF SHADING OF IMAGE
RECOGNITION OF IMAGE

1. In an optical character reader apparatus including an image sensor, and a background reflection plate having such reflectivity which allows said image sensor to detect the entry of a document carrying thereon image information within the field of view of said image sensor,

a method of correcting a shading phenomenon, comprising steps of:

setting a scan timing period of said image sensor at a first scan period;

reading said background reflection plate with said first scan period;

setting the scan timing period of said image sensor at a second scan period which is shorter than said first scan period;

transporting said document into the field of view of said image sensor;

detecting external shape of said document under the timing corresponding to said second scan period;

cutting out image information on said document on the basis of the detected external shape thereof;

correcting the cut out image information with respect to the shading with reference to the image sensor output derived through the reading operation under the timing corresponding to said first scan period, and

recognizing the image data having undergone the correction of the shading.

4,984,286

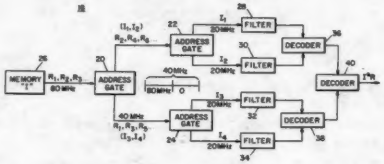
SPATIAL FILTER SYSTEM

Enrico Dolazza, Boston, Mass., assignor to Analogic Corporation, Peabody, Mass.

Filed Dec. 12, 1989, Ser. No. 448,917

Int. Cl.[5] G06K *9/36*

U.S. Cl. 382—54 **5 Claims**



1. A digital spatial filter system comprising:

means for separating a digital image formed of a matrix of pixels into four regularly distributed interleaved subimages from alternate rows and columns of the matrix pixels;

means for convolving each of said four digital subimages with two orthogonal, unidimensional vectors of a convolving kernel to produce four digitally filtered subimages; and

means for recombining said convolved four filtered digital subimages into the original image digitally filtered.

4,984,287

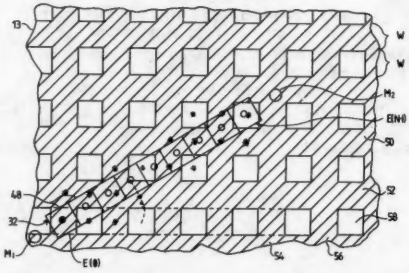
METHOD FOR ORIENTING A DUAL MOUSE OPTICAL SCANNER

Firooz Massoudi, Sunnyvale, Calif., assignor to MSC Technologies, Inc., Fremont, Calif.

Filed Nov. 15, 1988, Ser. No. 271,452

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—59 **17 Claims**



1. A method for establishing a coordinate system in a memory of a computer through communication with a scanner positioned over a grid pattern having indicia of position forming an orthogonal array of rows and columns of pixels with centers having coordinate positions, said computer having memory addresses corresponding to the coordinate positions of said pixels, said scanner having a detector array including detector elements 0 through N−1 for detecting pixel data from a page covered by said grid pattern and communicating said

pixel data to the computer for storage in said memory, a first position sensor separated a first predetermined distance from detector element 0 for detecting said indicia and communicating first indicia detection information to said computer, and a second position sensor separated a second predetermined distance from said first position sensor for detecting said indicia and communicating second indicia detection information to said computer, comprising the steps of:

placing said scanner on said grid pattern in a first position;

commencing detection of said indicia by said position sensors;

moving said scanner across the surface of said grid pattern in a predetermined manner to a second position and communicating said first and second information to said computer;

determining the distance (DY) on said grid pattern between said position sensors for each position of said scanner between said first position and said second position on said grid pattern until each position of said scanner determined to have a maximum distance between said position sensors has been established;

determining the average position of all positions of said scanner determined to have said maximum distance; and

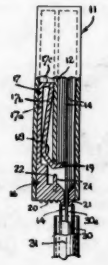
establishing the origin of said coordinate system as a memory address corresponding to the coordinate position of one of said position sensors when said scanner was positioned at said average position and establishing one axis of said coordinate system as a row or column of pixels closest to the coordinate position of said origin and the coordinate position of said other position sensor.

4,984,288

LEAD REFILL CARTRIDGE FOR MECHANICAL PENCIL

Tor H. Petterson, 31248 Palos Verdes Dr. W., Rancho Palos Verdes, Calif. 90274

Filed Jun. 7, 1989, Ser. No. 362,516
Int. Cl.[5] B43K *19/14*
U.S. Cl. 401—86 **8 Claims**



1. A cartridge for storing pencil leads and dispensing such leads in the lead storage chamber of a pencil comprising:

a main body portion having a chamber therein for storing pencil leads,

an assembly,

means for movably mounting said assembly in said main body portion,

said assembly including:

dispensing means having an aperture formed therein for dispensing leads, said dispensing means comprising means for matingly engaging the lead storage chamber of the pencil,

gate means positioned in a path between the chamber of said main body portion and said dispensing means aperture for preventing the pencil leads stored in said chamber from reaching said aperture, and

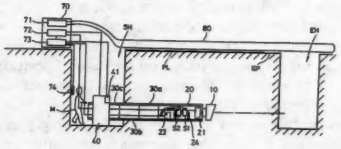
means including said dispensing means for driving said gate means out of said path to permit said pencil leads to reach said aperture and to be dispensed from said dispensing means, said driving means being operated in response to downward force of said dispensing means against said pencil chamber, thereby causing motion of said assembly relative to the main body portion of said cartridge.

4,984,289

APPARATUS FOR CONTROLLING UNDERGROUND EXCAVATOR

Shuji Arakawa, and Tatsuo Mimura, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP87/00566, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO88/01012, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 30, 1987, Ser. No. 309,726
Claims priority, application Japan, Jul. 31, 1986, 61-182079
Int. Cl.[5] F16L *1/00*
U.S. Cl. 405—184 **2 Claims**



1. An apparatus for controlling an underground excavator of which excavating head connected to the fore end of a rod pipe and of which pilot head are propelled by actuating a propelling jack in such a manner as to follow an excavation planned line extending over the ground surface while a plurality of rod pipes having a predetermined length are successively connected to one after another so that a tunnel is excavated between a start pit and a target pit along said excavation planned line, wherein said apparatus comprises:

a magnetic field generating cable laid on the ground surface corresponding to the excavating planned line, having a going line and a returning line maintained at an equal distance from said excavation planned line, to generate a predetermined intensity of magnetic field by causing a properly determined intensity of electric current to flow therethrough;

excavating angle correcting means adapted to obtain a positional deviation of the existent position assumed by said pilot head relative to an excavation planned value of the pilot head when the generated magnetic field is detected and then automatically correct an excavating angle of said excavating head on the basis of said positional deviation, said excavating angle correcting means comprising:

a first magnetic field detecting element immovably supported in the pilot head for detecting a magnetic field generated by the magnetic field generating cable utilizing an electromotive voltage induced by the magnetic field in such a manner that the direction of detecting of the magnetic field is inclined by a predetermined angle from a perpendicularly extending axis as viewed from the front side in the direction of propelling of the pilot head;

a second magnetic field detecting element immovably supported in the pilot head for detecting a magnetic field generated by the magnetic field generating cable utilizing an electromotive voltage induced by the magnetic field in such a manner that a direction of detecting of the magnetic field relative to said second magnetic field detecting element intersects the direction of detecting of the magnetic field relative to said first magnetic field detecting element at a predetermined angle in a linear symmetrical relationship with respect to the

perpendicularly extending axis as viewed from the front side in the direction of propelling of the pilot head;

first calculating means for obtaining a positional deviation relative to the excavation planned line as viewed in the transverse direction as an amount of deviation from a balanced point in the magnetic field generated by the going line and the returning line of the magnetic field generating cable on the basis of a ratio of the value of a magnetic field detected by said first magnetic field detecting element to the value of a magnetic field generated by said second magnetic field detecting element;

inclination detecting means accommodated in the pilot head for detecting an inclination of the pilot head relative to the horizontally extending plane;

propelled distance detecting means for detecting a propelled distance of the pilot head from the start pit on the basis of the number of used rod pipes;

second calculating means for obtaining a positional deviation of the pilot head as viewed in the vertical direction relative to the depth planned value preset from the ground surface on the basis of a detected value of said inclination detecting means and a detected value of said propelled distance detecting means;

whereby an excavating angle of said excavating head is automatically corrected on the basis of positional deviations obtained by said first and second calculating means; and

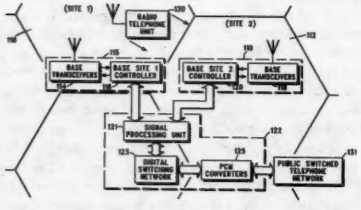
commanding means disposed in said start pit as a remote actuating unit to issue commands indicative of start and stop of propelling operation to be performed by said propelling jack by manually handling said commanding means in a suitable manner.

4,984,290

METHOD OF CONTROLLING COMMUNICATIONS IN A CELLULAR RADIOTELEPHONE SYSTEM

Stephen N. Levine, Itasca, and Larry Puhl, Sleepy Hollow, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 4, 1988, Ser. No. 228,071
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 455—33 **13 Claims**



1. A method of controliing communicating between a radiotelephone and one of a plurality of cell sites in a cellular-type radiotelephone communication system, comprising the steps of:

providing a plurality of digital signals identifiable with a uniquely identified cell;

transmitting the digital signals between the radiotelephone and the uniquely identified cell at a first subaudible bit rate; and

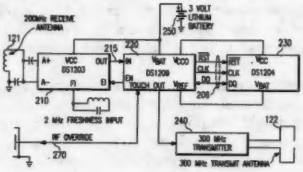
transmitting data messages between the radiotelephone and the uniquely identified cell at a second subaudible digital bit rate.

4,984,291

CODED COMMUNICATION SYSTEM WITH SHARED SYMBOLS

Donald R. Dias, Carrollton, and Robert D. Lee, Denton, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 9, 1988, Ser. No. 282,008
Int. Cl.[5] H04B *7/26, 1/16*
U.S. Cl. 455—38 **17 Claims**



1. A communication system, comprising:

at least two stations including respective RF transmitter/-receiver pairs;

said stations respectively including encoding and decoding circuits connected and programmed to perform encoding and decoding

in accordance with a protocol which includes multiple symbols of different respective durations, wherein at least some of said symbols are decoded by said decoding circuits to commands including a read command and at least two write commands;

said commands provided by said decoding circuits in at least one of said stations being connected to control access to a respective memory;

and wherein said decoding circuit decodes overhead bits to determine a direction of data flow;

and wherein said read command is encoded by a shared symbol, which also encodes one of said write commands;

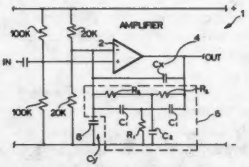
and wherein said decoding circuit decodes said shared symbol in accordance with said direction of data flow.

4,984,292

BANDPASS AMPLIFIER AND RECEIVER USING BANDPASS AMPLIFIER

Ted I. Millen, Don Mills, Canada, assignor to Correpro (Canada) Inc., Scarborough, Canada

Filed Sep. 28, 1988, Ser. No. 250,071
Int. Cl.[5] H04B *13/02*
U.S. Cl. 455—40 **37 Claims**



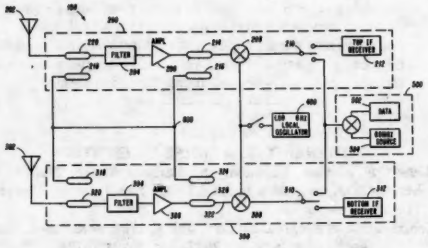
1. A bandpass amplifier comprising a single stage operational amplifier, a bridged "T" network band elimination filter in a negative feedback path of said amplifier, and a phase shift correcting capacitor associated with said bridged "T" network band elimination filter to effect a phase shift sufficient to maintain an appropriate feedback such that said amplifier is stable.

4,984,293

MULTI-CHANNEL MICROWAVE RECEIVER HAVING SELF-TEST CAPABILITY

Kathleen M. Cummings, and Russell W. Hanson, both of Melbourne, Fla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 17, 1989, Ser. No. 423,077
Int. Cl.[5] H04B *17/00*
U.S. Cl. 455—133 8 Claims



1. An improved multi-channel microwave receiver of the type having a first antenna, a first amplifier coupled with said first antenna, a first amplifier coupled with a first filter, a first mixer coupled with said first amplifier and with a local oscillator, and a first IF receiver coupled with said first mixer, and a second antenna, a second filter coupled with said second antenna, a second amplifier coupled with said second filter, a second mixer coupled with said second amplifier and said local oscillator and a second IF receiver coupled with said second mixer; wherein the improvement comprises:

means for generating a predetermined data modulated signal;

means for providing said data modulated signal to said first mixer for mixing with said local oscillator to form a test signal; and

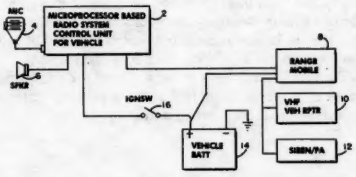
means for providing said test signal to said second amplifier.

4,984,294

RADIO COMMUNICATIONS DEVICE INCORPORATING CHANNEL GUARD DECODE AND PRIORITY CHANNEL SCANNING

Michael W. Smith, and Michael B. Heilman, both of Forest, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jul. 15, 1988, Ser. No. 219,125
Int. Cl.[5] H04B *17/02*
U.S. Cl. 455—166 48 Claims



1. In a radio communications device having a receiver for receiving a predetermined pattern of tones or digital data for enabling the receiver to receive transmitted audio signals, apparatus for detecting the presence of said predetermined pattern comprising:

means for defining a first timing window, said means for defining a first timing window including means for defining a variable time period whose length is dependent upon a characteristic of said predetermined pattern;

first means for determining whether said predetermined pattern might be present at a time defined by said first timing window and for generating a pattern might be present signal if said predetermined pattern might be present;

means responsive to said pattern might be present signal for defining a second timing window;

second means for determining during said second timing window whether said predetermined pattern is most probably present and for generating a pattern most probably present signal; and

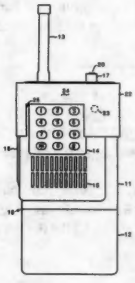
means responsive to said pattern most probably present signal for enabling the receiver to receiver transmitted audio signals.

4,984,295

PROGRAMMABLE ELECTRONIC DEVICE

Scott M. Engstrom, N. Lauderdale; Christopher A. Myers, Palm Bay, and Brian K. Terry, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 1,128, Jan. 7, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 483,973
Int. Cl.[5] H04B *1/16, 1/40*
U.S. Cl. 455—186 11 Claims



1. A programmable ratio comprising:

memory means for storing radio program information,

control means, operatively connected to the memory means, for programming and reading the memory means,

data entry means connected to the control means, the data entry means including a keypad,

program enable means connected to the control means, for selectively enabling and inhibiting programming of the memory means, and including field actuable switching means located within the device and actuable by an externally supplied field for enabling programming of the device, and

a programming fixture selectively receivable about the radio, the programming fixture including a magnet positioned to provide said externally supplied field for actuating said field actuable switching means.

4,984,296

TUNED RADIO APPARATUS

Larry Schotz, 425 Green Bay Rd., Cedarburg, Wis. 53012

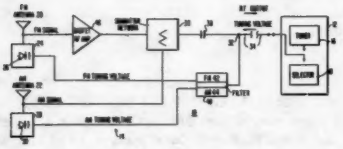
Filed Feb. 11, 1988, Ser. No. 155,151
Int. Cl.[5] H04B *1/18*
U.S. Cl. 455—193 18 Claims

1. Tuned radio apparatus, comprising:

receiver means for producing an output signal in response to selection command for a desired radio frequency signal having a respective selected frequency, said receiver means including tuning voltage generating means for generating a tuning voltage indicative of said selected frequency and selecting means for selecting said desired

radio frequency signal from signals supplied thereto in response to said tuning voltage; and

antenna means tunable in response to said tuning voltage to resonate at said selected frequency for receiving a radio frequency signal having said selected frequency and for supplying the same to said receiver means, said antenna means including an antenna terminal to which the received radio frequency signal is supplied, said antenna



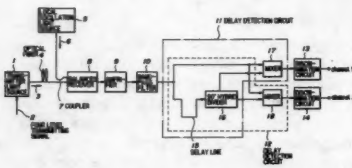
terminal further connected to said tuning voltage generating means of said receiver means to receive said tuning voltage, at least one resonating antenna tunable to said selected frequency, filter means connected to said antenna terminal for outputting said tuning voltage and control means connected to receive said tuning voltage from said filter means for tuning said antenna to said selected frequency.

4,984,297

FOUR LEVEL FREQUENCY SHIFT KEYING OPTICAL COMMUNICATION APPARATUS

Kaoru Manome, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,221
Claims priority, application Japan, Oct. 29, 1987, 62-275050
Int. Cl.[5] H04B *10/06*
U.S. Cl. 455—619 **6 Claims**



1. A four level FSK optical communication apparatus comprising,

a light source for emitting a signal light modulated in FSK with a four level transmitting signal,

a local oscillation light source for emitting a local oscillation light,

an optical coupler for combining said signal and local oscillation lights to produce a combined light,

means for converting said combined light to an intermediate frequency signal,

means for dividing said intermediate frequency signal into first and second intermediate frequency signals,

means for delaying said second intermediate frequency signal to produce a delayed intermediate frequency signal,

a phase shift means for shifting a phase of said delayed intermediate frequency signal by $\pi/2$ to produce a phase shift intermediate frequency signal,

a first mixing means for mixing said phase shift intermediate frequency signal and said first intermediate frequency signal to produce a first delay detection signal, and

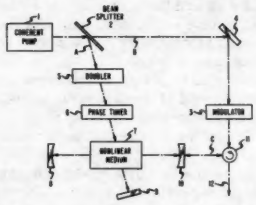
a second mixing means for mixing said delayed intermediate frequency signal and said first intermediate frequency signal to produce a second delay detection signal.

4,984,298

WIDEBAND LOW NOISE DETECTOR

Richart E. Slusher, Lebanon, and Bernard Yurke, Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 880,796, Jul. 1, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 120,734
Int. Cl.[5] H04B *10/06*
U.S. Cl. 455—619 **9 Claims**



1. A coherent communications system comprising a low-noise device comprising first means for producing therein squeezed states of an electromagnetic field, such that the noise associated with at least two frequencies of said field is reduced relative to the minimum uniform level of the noise of said field, said first means comprising

(a) a parametric amplifier comprising a cavity and, in said cavity, a non-linear medium;

(b) input means for introducing an electromagnetic field of a first frequency into the parametric amplifier, and

(c) output means for coupling a multi-frequency electromagnetic field from the parametric amplifier, the multi-frequency field coupled from the parametric amplifier comprising at least two quantum-correlated frequencies that are different from the first frequency, the field at said two field frequencies exhibiting said squeezed states;

(d) said device further comprising means for comparing the phases of a reference signal and a squeezed state output signal from said parametric amplifier.

DESIGN PATENTS

GRANTED JAN. 8, 1991

ERRATA

For CLASS	See PATENT NO.
D26-002	313,606

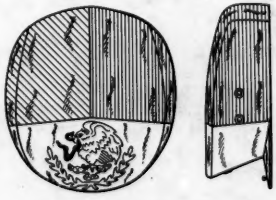
DESIGNS

JANUARY 8, 1991

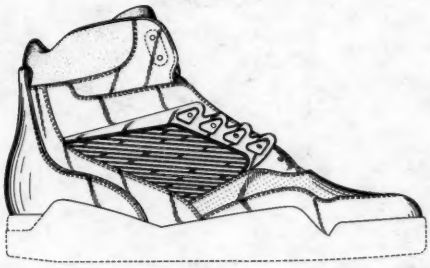
313,495
VEST
Gilberto B. Diaz, P.O. Box 3287, Taos, N. Mex. 87571
Division of Ser. No. 732,554, May 10, 1985, Pat. No. D. 298,581.
This application Nov. 10, 1988, Ser. No. 269,552
Term of patent 14 years
U.S. Cl. D2—190

313,496
COMBINED BASKETBALL GLOVE AND HAT
Richard K. Pesta, 6324 Boone Ave. North Apt. 3, Brooklyn Park, Minn. 55428
Filed May 21, 1987, Ser. No. 52,357
The portion of the term of this patent subsequent to Jun. 6, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—250

313,497
CAP
Fernando U. Amozorrutia, and Delia Amozorrutia, both of 430 Pasadena, Azusa, Calif. 91702
Filed Jul. 13, 1987, Ser. No. 72,579
Term of patent 14 years
U.S. Cl. D2—244

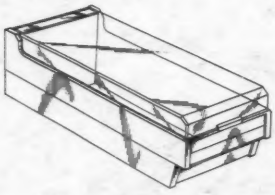


313,498
SHOE UPPER
Michael A. Aveni, Lake Oswego, Oreg., assignor to Nike, Inc. and Nike International, Ltd., both of Beaverton, Oreg.
Filed Jun. 14, 1990, Ser. No. 537,765
Term of patent 14 years
U.S. Cl. D2—314



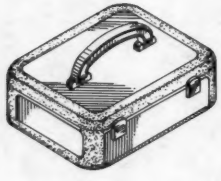
313,499
KNITTING NEEDLE
Alice M. Pollock, and Bruce W. Pollock, both of 2321 E. Beverly Rd., Shorewood, Wis. 53211
Filed Jun. 1, 1987, Ser. No. 56,981
Term of patent 14 years
U.S. Cl. D3—28

313,500
DISPLAY DRAWER FOR TAPE CASSETTES OR THE LIKE
Yun S. Chow, Kowloon, Hong Kong, assignor to Sun Hing Audio Equipment Mfy., Limited, Kowloon, Hong Kong
Filed Nov. 12, 1986, Ser. No. 930,223
The portion of the term of this patent subsequent to Jul. 3, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—35



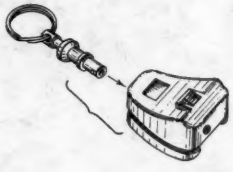
313,501
HOLDER FOR EYEGLASSES
Lawrence Levy; Brian Folloder, both of Houston, Tex., and Glenn Konen, Ft. Collins, Colo., assignors to Expressions, Inc., Houston, Tex.
Filed Oct. 17, 1988, Ser. No. 258,978
Term of patent 14 years
U.S. Cl. D3—34

313,502
COSMETIC BOX
-Smith Vasky, 820 Riverside Dr., Holly Hill, Fla. 32017
Filed Jun. 27, 1988, Ser. No. 212,422
Term of patent 14 years
U.S. Cl. D3—39



313,503
FLAMINGO BAG
Catherine M. Senitt, R.R. #1, Carnarvon, Ontario, Canada (K0M 1J0)
Filed Aug. 9, 1988, Ser. No. 230,268
Claims priority, application Canada, Apr. 7, 1988, 07-04-88-19
Term of patent 14 years
U.S. Cl. D3—45

313,504
COMBINED KEY HOLDER AND LIGHT
Pierre Charet; Duke Kraai, both of Miami, Fla., assignor to Rally Accessories, Inc., Miami, Fla.
Filed Nov. 26, 1986, Ser. No. 935,553
Term of patent 14 years
U.S. Cl. D3—63

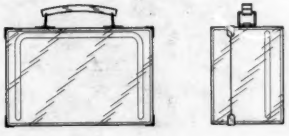


313,505
BOX FOR STORING INSULIN AND INSULIN-ADJUNCTS
Norbert Leopoldi, Chicago, and William Heinrich, McHenry, both of Ill., assignors to The Cloverline, Inc., Chicago, Ill.
Filed Jun. 8, 1988, Ser. No. 203,863
Term of patent 14 years
U.S. Cl. D3—74

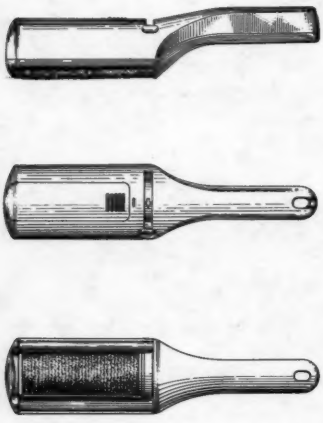
313,506
SUITCASE
Eve Bjorg, Liechtenstein, Sweden, assignor to Bjorg Line Establishment, Liechtenstein
Filed Apr. 14, 1988, Ser. No. 182,073
Claims priority, application World Int. Prop. O., Oct. 16, 1987, DM/009 489
Term of patent 14 years
U.S. Cl. D3—76

313,507
TROWEL HOLDER FOR ATTACHMENT TO BELT
Harvey E. Sawyer, 10157 Valley Home, Whittier, Calif. 90603
Filed Mar. 2, 1987, Ser. No. 20,649
Term of patent 14 years
U.S. Cl. D3—105

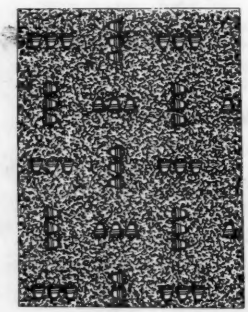
313,508
CASE FOR A RADIO OR THE LIKE
Pierre-Yves Azuelos, Paris, France, assignor to PYM, Inc., New York, N.Y.
Filed Feb. 19, 1988, Ser. No. 158,145
Term of patent 14 years
U.S. Cl. D3—30.1



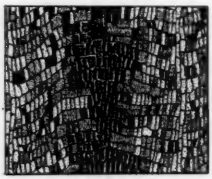
313,509
BRUSH FOR REMOVING LINT
Muneyuki Ueda, Nishinomiya, Japan, assignor to Nippon Seal Co., Ltd., Osaka, Japan
Filed Feb. 27, 1989, Ser. No. 315,513
Claims priority, application Japan, Aug. 30, 1988, 63-34389
Term of patent 14 years
U.S. Cl. D4—137



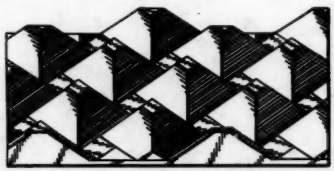
313,510
CONTINUOUS SHEET MATERIAL
John L. Sears, West Bridgford, England, assignor to Bell-Fruit Manufacturing Company Limited, Lenton, England
Filed Mar. 29, 1988, Ser. No. 174,676
Claims priority, application United Kingdom, Oct. 31, 1987, 1045975
Term of patent 14 years
U.S. Cl. D5—20



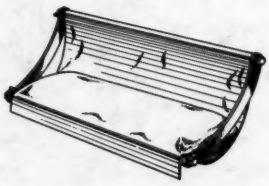
313,511
SYNTHETIC LEATHER HAVING A PATTERNED SURFACE
Jun Ki Oh, Seoul, Rep. of Korea, assignor to Kyung Shin Industrial Co., Ltd., Kyungki, Rep. of Korea
Filed Feb. 11, 1988, Ser. No. 156,199
Term of patent 14 years
U.S. Cl. D5—28



313,512
EMBOSSED DIAPER COVER STOCK OR SIMILAR ARTICLE
Richard J. Legare, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 15, 1987, Ser. No. 73,671
Term of patent 14 years
U.S. Cl. D5—53



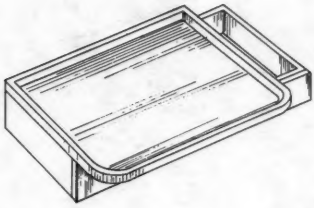
313,513
SWING SEAT
Janet L. Girecky, and Francis D. Girecky, both of 202 E. Oak St., Kent, Ohio 44240
Filed Aug. 3, 1987, Ser. No. 80,682
Term of patent 14 years
U.S. Cl. D6—347



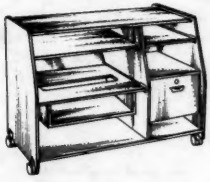
313,514
BAR STOOL
Vladimir W. Zakharov, West Covina, Calif., assignor to Mikhail Darafeev, Inc., Baldwin Park, Calif.
Filed May 4, 1987, Ser. No. 45,145
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—360

313,515
ARMCHAIR
Noel S. D. Wood, Lindfield, Australia, assignor to Sebel Furniture Ltd., Bankstown, Australia
Division of Ser. No. 845,079, Mar. 18, 1986. This application Oct. 3, 1988, Ser. No. 226,159
Claims priority, application Australia, Sep. 19, 1985, 2629/85
Term of patent 14 years
U.S. Cl. D6—380

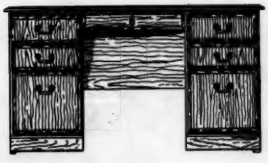
313,516
CHANGING TABLE FOR A BABY
Allan J. Socher, Paterson, N.J., assignor to RPF Holding Corporation, Paterson, N.J.
Filed Oct. 16, 1987, Ser. No. 110,655
Term of patent 14 years
U.S. Cl. D6—384



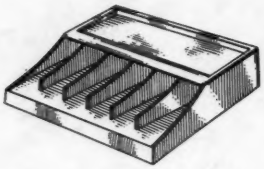
313,517
COMPUTER WORKSTATION
Carlos Ugalde, San Dimas, Calif., assignor to Continental Engineering Group, Inc., Irwindale, Calif.
Filed Aug. 19, 1987, Ser. No. 86,840
Term of patent 14 years
U.S. Cl. D6—425



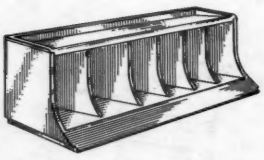
[illegible]18
EXECUTIVE DESK
Paul Bush, Lakewood, and Bruce O. Anderson, Jamestown, both of N.Y., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed Oct. 28, 1988, Ser. No. 264,173
Term of patent 14 years
U.S. Cl. D6—428



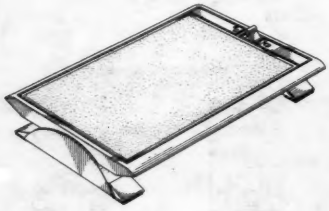
313,519
COMBINED RACK FOR BILL STRAPS AND UTILITY TRAY
Mitchell L. Block, Highland Park, Ill., assignor to Block and Company, Inc., Wheeling, Ill.
Filed Aug. 31, 1987, Ser. No. 91,377
Term of patent 14 years
U.S. Cl. D6—467



313,520
COMBINED RACK FOR COIN WRAPPERS AND UTILITY TRAY
Mitchell L. Block, Highland Park, Ill., assignor to Block and Company, Inc., Wheeling, Ill.
Filed Aug. 31, 1987, Ser. No. 91,378
Term of patent 14 years
U.S. Cl. D6—467



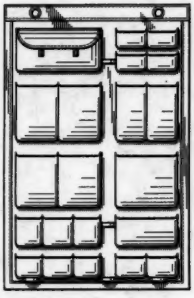
313,521
ADJUSTABLE FOOT REST
H. Charles Hassel, Los Angeles, and R. Jeff Sheppard, Northridge, both of Calif., assignors to MicroComputer Accessories Inc., Los Angeles, Calif.
Filed Feb. 8, 1988, Ser. No. 153,038
Term of patent 14 years
U.S. Cl. D6—501



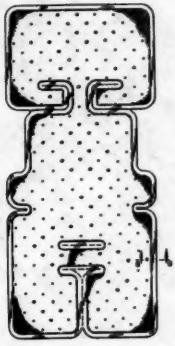
313,522
TOWEL HOLDER
John R. Bingham, 9300 Ensley La., Leawood, Kans. 66206
Filed Oct. 11, 1988, Ser. No. 255,426
Term of patent 14 years
U.S. Cl. D6—547

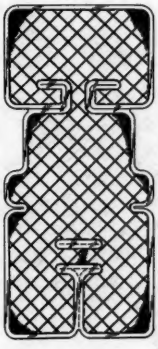
313,523
WALL MOUNTED CUPBOARD
Jonathan Grey, Midhurst, England, assignor to Smallbone PLC, Berkshire, England
Filed Dec. 18, 1987, Ser. No. 134,530
Claims priority, application United Kingdom, Jun. 19, 1987, 1042979
Term of patent 14 years
U.S. Cl. D6—560

313,524
ANIMAL GROOMING EQUIPMENT ORGANIZER
Helen T. Barnes, R.R. #2, Box 117, Spencer, Mass. 01562
Filed Feb. 10, 1989, Ser. No. 309,061
Term of patent 14 years
U.S. Cl. D6—553



313,525
INFANT SEAT LINER
Lee E. Perdelwitz, Jr., Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Apr. 29, 1988, Ser. No. 187,894
Term of patent 14 years
U.S. Cl. D6—611





313,526

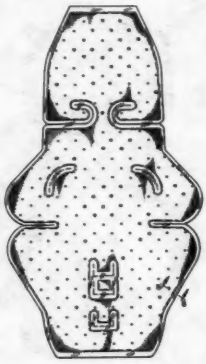
INFANT SEAT LINER

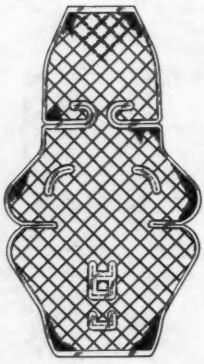
Janice J. Rankin, and Marilyn M. Pearson, both of Portland, Oreg., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 29, 1988, Ser. No. 187,896

Term of patent 14 years

U.S. Cl. D6—611





313,527

INFANT SEAT LINER

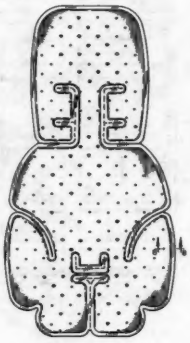
Lee E. Perdelwitz, Jr., Tacoma, Wash., and David E. Hanke, San Diego, Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.

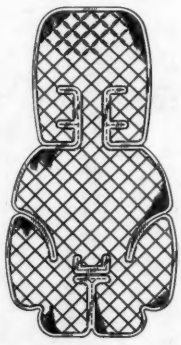
Filed Apr. 29, 1988, Ser. No. 187,897

The portion of the term of this patent subsequent to Dec. 4, 2004, has been disclaimed.

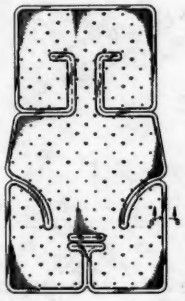
Term of patent 14 years

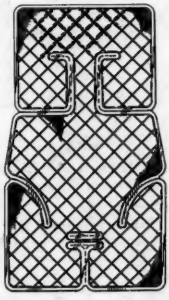
U.S. Cl. D6—611



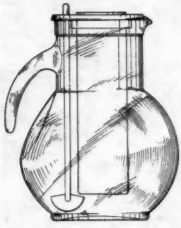


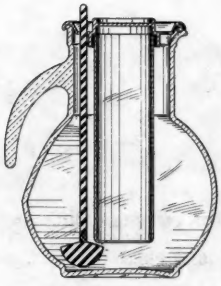
313,528
INFANT SEAT LINER
Lee E. Perdelwitz, Jr., Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Apr. 29, 1988, Ser. No. 188,400
Term of patent 14 years
U.S. Cl. D6—611





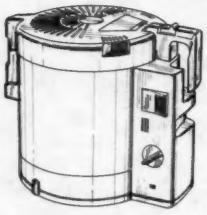
313,529
COMBINED JUG, STIRRER, AND ICE HOLDER
Pier L. Bormioli, Mariano, Italy, assignor to Vetreria Parmense Bormioli Rocco S.p.A., Parma, Italy
Filed Jul. 14, 1987, Ser. No. 72,850
Claims priority, application Italy, May 15, 1987, 28951 B/87
Term of patent 14 years
U.S. Cl. D7—317



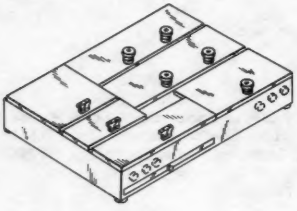


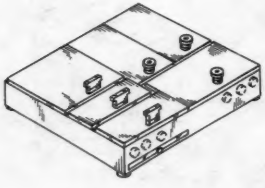
313,530
DEEP FRYER
Ernest Leiros, Dijon, France, assignor to SEB, Selongey, France
Filed Mar. 25, 1988, Ser. No. 173,533
Claims priority, application France, Sep. 30, 1987, 875707
Term of patent 14 years
U.S. Cl. D7—354

313,531
DEEP FRYER
Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to MOULINEX, Societey Anonyme, Bagnolet, France
Filed Aug. 6, 1987, Ser. No. 82,181
Claims priority, application France, Feb. 9, 1987, 87 0628
Term of patent 14 years
U.S. Cl. D7—360



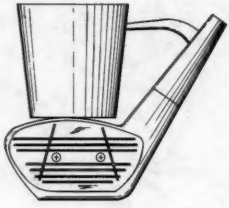
313,532
COMBINATION COVERED GRILL AND WARMING PLATES
William Smith, 10320 Bilston Ct., No. 1, Creve Coeur, Mo. 63141
Filed Jul. 29, 1988, Ser. No. 226,217
Term of patent 14 years
U.S. Cl. D7—363





313,533
WHISK
Edgar Rixen, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Nov. 22, 1988, Ser. No. 275,220
Claims priority, application Fed. Rep. of Germany, May 26, 1988, 5 MR 9858
Term of patent 14 years
U.S. Cl. D7—380

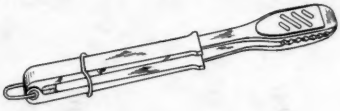
313,534
BEVERAGE CUP OR SIMILAR ARTICLE
Fred Stadtmueller, 2222 20 St., NW., Winter Haven, Fla. 33881
Filed Oct. 7, 1988, Ser. No. 254,785
Term of patent 14 years
U.S. Cl. D7—515



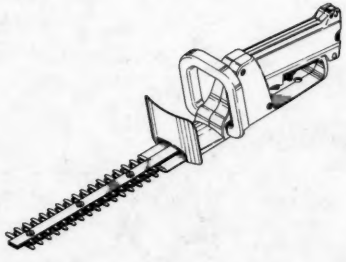
313,535
CUP OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,410
Term of patent 14 years
U.S. Cl. D7—535

313,536
PEPPER MILL
Tom David, Nantucket Island, Mass., assignor to Tom David, Inc., Nantucket Island, Mass.
Continuation-in-part of Ser. No. 256,242, Sep. 30, 1988, abandoned. This application Nov. 28, 1988, Ser. No. 276,572
Term of patent 14 years
U.S. Cl. D7—679

313,537
TONGS
Ian M. Chisholm, Hawthorn East, Australia, assignor to McPherson's Limited, Australia
Filed Dec. 6, 1988, Ser. No. 280,657
Term of patent 14 years
U.S. Cl. D7—686



313,538
HEDGE TRIMMER
Fusao Fushiya, and Hideki Ohkubo, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed May 23, 1989, Ser. No. 355,676
Claims priority, application Japan, Nov. 24, 1988, 63-45760
Term of patent 14 years
U.S. Cl. D8—8

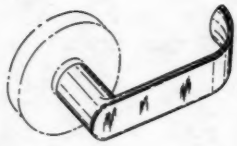


313,539
TOOL FOR INSERTING AND REMOVING A TERMINAL LUG CAP
John D. Martin, 6465 N. Rand, Moorpark, Calif. 93021
Filed Jan. 7, 1988, Ser. No. 141,674
Term of patent 14 years
U.S. Cl. D8—14

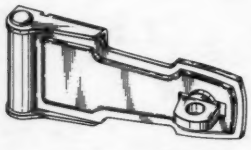
313,540
UTILITY KNIFE
John W. Toor, 343 Middlefield Rd., Palo Alto, Calif. 94301, and James E. Sacherman, 1550 California Ave., Palo Alto, Calif. 94306
Filed Feb. 19, 1988, Ser. No. 158,144
Term of patent 14 years
U.S. Cl. D8—98

313,541
COMBINED LEVER AND ESCUTCHEON PLATE FOR DOORS
Werner Thur, 56 Rue du Fief, 62840 Sailly sur La Lys, France
Filed Dec. 18, 1987, Ser. No. 134,920
Term of patent 14 years
U.S. Cl. D8—301

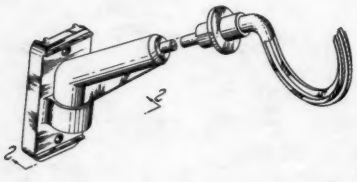
313,542
HANDLE FOR A DOOR OR THE LIKE
Peter S. Fayerman, Bryn Mawr, Pa., assignor to Baldwin Hardware Corporation, Reading, Pa.
Filed Apr. 6, 1987, Ser. No. 34,567
Term of patent 14 years
U.S. Cl. D8—308



313,543
HASP-TYPE DESIGN
Walter J. MacFarlane, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.
Division of Ser. No. 288,801, Dec. 22, 1988, Pat. No. D. 309,248.
This application Oct. 10, 1989, Ser. No. 418,446
Term of patent 14 years
U.S. Cl. D8—338

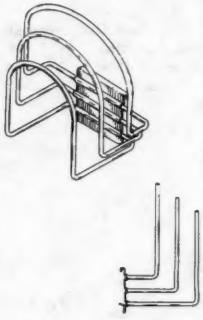


313,544
POST MOUNTED MOORING LINE HOLDER
Patrick Scherer, 36939 Harper - Apt. 20, Mt. Clemens, Mich. 48043
Filed Dec. 21, 1987, Ser. No. 135,750
Term of patent 14 years
U.S. Cl. D8—355



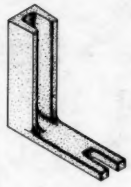
313,545
TURNBUCKLE BOOT
James D. Roselli, P.O. Box 17107, Seattle, Wash. 98107
Filed May 5, 1988, Ser. No. 190,699
Term of patent 14 years
U.S. Cl. D8—355

313,546
WORK-STATION ORGANIZER FOR SUPPORTING PAPER ARTICLES
Jean Beirise, and John Coons, both of Cincinnati, Ohio, assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Apr. 22, 1987, Ser. No. 41,587
Term of patent 14 years
U.S. Cl. D8—373

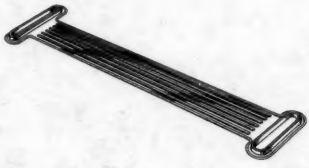


313,547
WALL MOUNTED STRAP FOR HOLDING TOOLS OR SIMILAR ARTICLES
Joseph M. Buckles, 34400 SE. Kimbley Rd., Corbett, Oreg. 97019
Filed Apr. 18, 1988, Ser. No. 182,767
Term of patent 14 years
U.S. Cl. D8—373

313,548
BRACKET
William J. Rourke, 216 Clr. Dr., Terre Haute, Ind. 47803
Filed Apr. 21, 1988, Ser. No. 184,724
Term of patent 14 years
U.S. Cl. D8—373



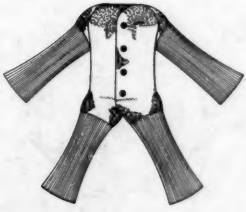
313,549
CORD SLING FOR HANGING COILED HOSES OR THE LIKE
Donald Embree, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 29, 1988, Ser. No. 213,309
Term of patent 14 years
U.S. Cl. D8—373



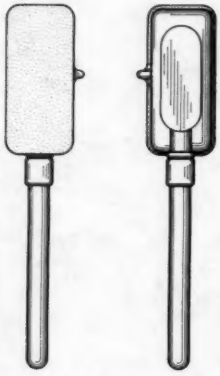
313,550
HANGER FOR SUSPENDING A HARDBOARD MEMBER FROM A SURFACE
Eugene M. Lorincz, Cinnaminson, N.J., assignor to Moore Push-Pin Company, Wyndmoor, Pa.
Filed Jul. 20, 1988, Ser. No. 221,621
Term of patent 14 years
U.S. Cl. D8—373

313,551
BUCKET-SUPPORTING LADDER ACCESSORY
Jesse A. Jameson, 5050 E. 5th St., #E-12, Tucson, Ariz. 85711
Filed Mar. 22, 1988, Ser. No. 171,294
Term of patent 14 years
U.S. Cl. D8—373

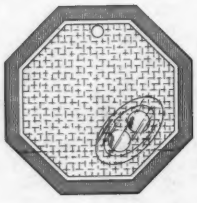
313,552
SOCK PACKAGE IN PAJAMA SHAPE
Nancy K. Carver, Kent, Wash., assignor to P. J. Sox Enterprises, Inc., Renton, Wash.
Filed Mar. 20, 1987, Ser. No. 28,533
Term of patent 14 years
U.S. Cl. D9—319



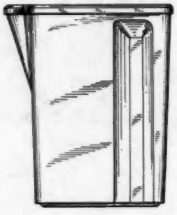
313,553
COMBINED LOTION APPLICATOR AND RESERVOIR HANDLE
Robert L. Lewis, Jr., 35 Union Ave., #34, Campbell, Calif. 95008
Filed Mar. 31, 1988, Ser. No. 176,403
Term of patent 14 years
U.S. Cl. D9—338



313,554
PACKAGE FOR MEDICAL CONTENTS
William L. Clark, II, 965-35 W. Lincoln Ave., Escondido, Calif. 92026
Filed Jan. 26, 1988, Ser. No. 148,991
Term of patent 14 years
U.S. Cl. D9—415

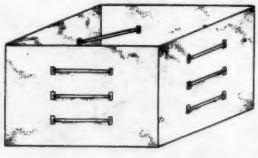


313,555
CONTAINER
Javier F. Jordi, Barcelona, Spain, assignor to Nutrexpa S.A., Spain
Filed Jun. 10, 1988, Ser. No. 204,786
Term of patent 14 years
U.S. Cl. D9—424

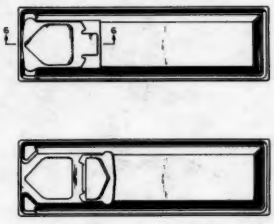


313,556
CONTAINER
Roy L. Smith, Williamsburg, Va., assignor to Rampart Packaging Inc., Williamsburg, Va.
Filed Dec. 23, 1987, Ser. No. 137,471
Term of patent 14 years
U.S. Cl. D9—425

313,557
BULK BOX
Gustave Straub, Milwaukee, and David P. Maul, Grafton, both of Wis., assignors to Jefferson Sanur fit Corporation, St. Louis, Mo.
Filed Sep. 8, 1986, Ser. No. 905,033
Term of patent 14 years
U.S. Cl. D9—432

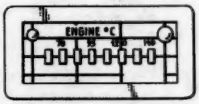


313,558
CONTAINER CLOSURE
Charles L. Gunn, Lawrenceburg, Ind.; Lewis A. Rupe, Fairfield, Ohio; Edmund H. Taylor, Covington, Ky.; Milton D. Spahni, Jr., Harrison, and Samuel Ross, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 12, 1987, Ser. No. 26,346
Term of patent 14 years
U.S. Cl. D9—449

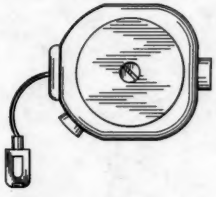


313,559
POCKET WATCH
Kevin S. McDonnell, 8509 Glen Campbell Rd., Philadelphia, Pa. 19128
Filed Jun. 18, 1987, Ser. No. 63,632
Term of patent 14 years
U.S. Cl. D10—37

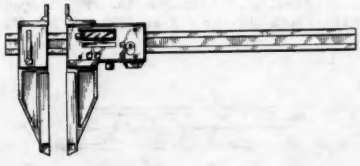
313,560
METER FOR MONITORING TEMPERATURE
Pentti M. Kummunsalo, Jännetie 1 E 34 B, Helsinki SF-00370, Finland
Filed Jul. 30, 1987, Ser. No. 79,792
Claims priority, application Finland, Feb. 3, 1987, 49/87
Term of patent 14 years
U.S. Cl. D10—57



313,561
AUTOMATIC CHALKLINE
Gregg Van Slyke, Box 422, Inlet, N.Y. 13360
Filed Jun. 29, 1987, Ser. No. 67,442
Term of patent 14 years
U.S. Cl. D10—65



313,562
SLIDE CALIPER
Hans Meyer, 24, rue du Bugnon, 1020 Renens, Switzerland
Filed Mar. 17, 1988, Ser. No. 169,355
Claims priority, application Switzerland, Sep. 22, 1987, 116.190
Term of patent 14 years
U.S. Cl. D10—73



313,563
COMBINED AUTOMOTIVE ELECTRICAL TESTING MODULE AND HOLDER/DISPLAY THEREFOR
Daniel Mieczkowski; David R. Ellingen; Larry D. Pacetti, all of Kenosha, and Steven E. Michalski, Franklin, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Feb. 22, 1988, Ser. No. 159,051
Term of patent 14 years
U.S. Cl. D10—78

313,564
KITCHEN SCALE
Brian Stephens, Dun Laoghaire, Ireland, assignor to Tricolor Corporation, Las Cruces, N. Mex.
Filed Jul. 27, 1987, Ser. No. 78,573
Claims priority, application United Kingdom, Jan. 30, 1987, 1039624
Term of patent 14 years
U.S. Cl. D10—92

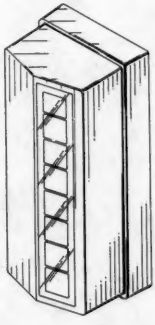
313,565
WEIGHT DISPLAY MODULE
Francesco L. Carnevale, Waynesboro, Miss., assignor to Sunbeam Corporation, Downers Grove, Ill.
Division of Ser. No. 931,455. Nov. 14, 1986, Pat. No. Des. 309,117. This application Jan. 16, 1990, Ser. No. 452,976
Term of patent 14 years
U.S. Cl. D10—94

313,566
WEIGHING SCALE
Daniele Tumidei, Via Bertini, 163, Forli , Italy (47100)
Filed Jun. 23, 1987, Ser. No. 65,701
Claims priority, application Italy, Jan. 16, 1987, 4712/87[U]
Term of patent 14 years
U.S. Cl. D10—93

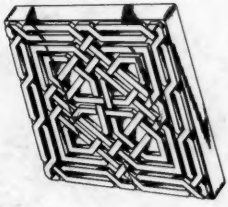
313,567
ALARM FOR DETECTING BATHTUB WATER LEVELS
Al Henry, 1178 Greenlaw, Memphis, Tenn. 38105, and Michael R. Tabron, 2001 Fairfall Dr., Apt. #4, Memphis, Tenn. 38116
Filed Oct. 5, 1987, Ser. No. 104,663
Term of patent 14 years
U.S. Cl. D10—106

313,568
PORTABLE SIGNALLING DEVICE FOR MONITORING TELEPHONE RINGS
Kal R. Castleberry, and Ginger L. Castleberry, both of 5100 Old Benton Rd., Paducah, Ky. 42002
Filed Feb. 6, 1989, Ser. No. 306,650
Term of patent 14 years
U.S. Cl. D10—106

313,569
COVER FOR A REMOTE INDICATOR LIGHT
Peter B. Allard, Minnetonka; Leland L. Howland, Belle Plaine; Jan H. Parker, Minneapolis, and David B. Ziegler, Eden Prairie, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Jun. 27, 1988, Ser. No. 211,602
Term of patent 14 years
U.S. Cl. D10—114



313,570
DOORBELL OR SIMILAR ARTICLE
James R. Lomas, Stockport, England, assignor to V. & E. Friedland Limited, Cheshire, England
Filed Nov. 10, 1988, Ser. No. 269,658
Claims priority, application United Kingdom, May 10, 1988, 1050639
Term of patent 14 years
U.S. Cl. D10—118



313,571
NECKLACE LENGTHENER
Diane Y. Brom, 454 Kent Rd., Riverside, Ill. 60546
Filed Oct. 27, 1987, Ser. No. 112,422
Term of patent 14 years
U.S. Cl. D11—86

313,572
DESK TOP NOVELTY
Rudolf M. Appenzeller, 10550 N.W. 77 Ct., Ste. 301, Hialeah Gardens, Fla. 33016
Filed Feb. 1, 1988, Ser. No. 150,727
Term of patent 14 years
U.S. Cl. D11—160

313,573

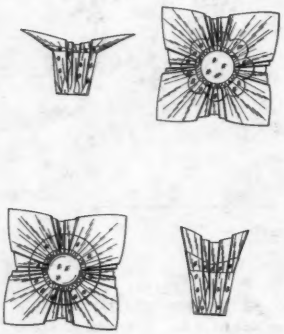
FLOWER POT COVER

Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly; Phyllis J. Bolk, both of Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Oct. 13, 1987, Ser. No. 107,801

Term of patent 14 years

U.S. Cl. D11—164



313,574

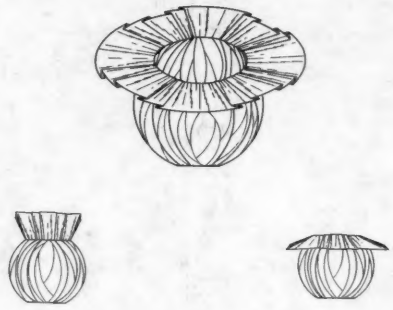
FLOWER POT COVER

Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.

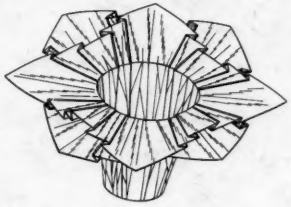
Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Oct. 13, 1987, Ser. No. 108,038

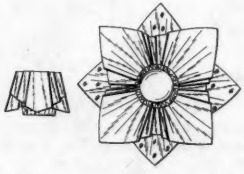
Term of patent 14 years

U.S. Cl. D11—164

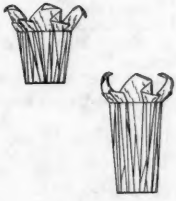


313,575
FLOWER POT COVER
Donald E. Weder; Erwin H. Weder, both of Highland, Ill.; Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Oct. 13, 1987, Ser. No. 108,035
Term of patent 14 years
U.S. Cl. D11—164

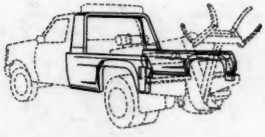




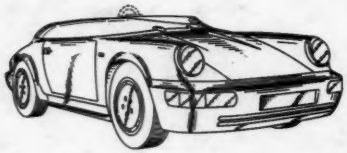
313,576
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Filed Apr. 20, 1989, Ser. No. 341,058
Term of patent 14 years
U.S. Cl. D11—164



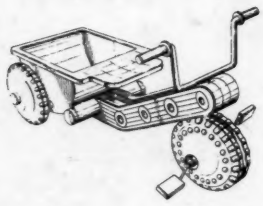
313,577
COMBINED TOW TRUCK BODY REAR QUARTER PANELS AND LIGHT BAR
Jack J. Verducci, 2050 Fairmont Dr., San Mateo, Calif. 94402
Filed Apr. 1, 1988, Ser. No. 176,590
Term of patent 14 years
U.S. Cl. D12—14



313,578
SPORTS CAR
Benjamin Dimson, Tiefenbronn-Muehlhausen, Fed. Rep. of Germany, assignor to Dr. Ing h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Mar. 4, 1988, Ser. No. 163,891
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, MR NO.6315
Term of patent 14 years
U.S. Cl. D12—91



313,579
TRICYCLE
Martin R. Disler, 17 Wolsey Mews, Kentish Town, London, NW5 2 DX, England
Filed Apr. 7, 1987, Ser. No. 35,498
Claims priority, application United Kingdom, Oct. 7, 1986, 1037212
Term of patent 14 years
U.S. Cl. D12—112

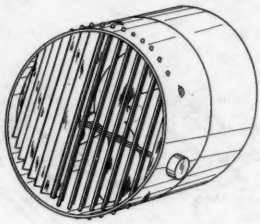


313,580
AUTOMOBILE TIRE
Yasuo Himuro, and Yuji Tateo, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 179,001
Claims priority, application Japan, Oct. 7, 1987, 62-40790
Term of patent 14 years
U.S. Cl. D12—146

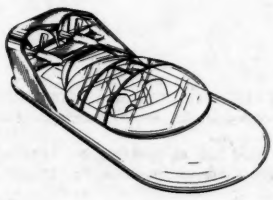
313,581
AUTOMOBILE TIRE
Akihito Goto, Tokyo, and Akira Tamura, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 179,003
Claims priority, application Japan, Oct. 7, 1987, 62-40791
Term of patent 14 years
U.S. Cl. D12—146

313,582
VEHICLE TIRE
Kohtaroh Tsutsumi, Tokyo, and Youichi Fukutome, Osaka, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Jun. 22, 1988, Ser. No. 210,529
Claims priority, application Japan, Jan. 8, 1988, 63-485
Term of patent 14 years
U.S. Cl. D12—146

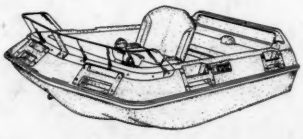
313,583
PROPULSION AND DEFLECTOR UNIT FOR WATERCRAFT
Neil A. Panyik, 97 W. Main St., Lucas, Ohio 44843
Filed Jun. 22, 1988, Ser. No. 210,310
Term of patent 14 years
U.S. Cl. D12—214



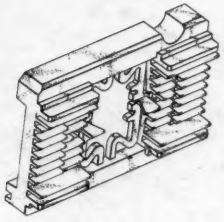
313,584
PNEUMATICALLY DRIVEN BOAT
Robert L. Linebaugh, 707 Cape Haze Way, Naples, Fla. 33942
Filed Jun. 6, 1988, Ser. No. 202,430
Term of patent 14 years
U.S. Cl. D12—305



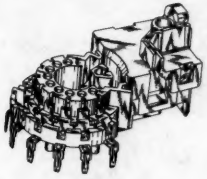
313,585
MOTORBOAT
Seiichi Ino, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan
Filed Oct. 7, 1988, Ser. No. 255,524
Term of patent 14 years
U.S. Cl. D12—310



313,586
INTEGRATED CIRCUIT CHIP CARRIER
Joseph I. Vitek, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 24, 1986, Ser. No. 934,373
Term of patent 14 years
U.S. Cl. D13—182

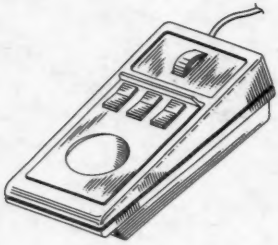


313,587
CATHODE RAY TUBE SOCKET
Hirofumi Inaba, and Yasunori Nishikawa, both of Yao, Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan
Filed May 10, 1988, Ser. No. 192,406
Claims priority, application Japan, Nov. 26, 1987, 62-48538
The portion of the term of this patent subsequent to Feb. 2, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—146

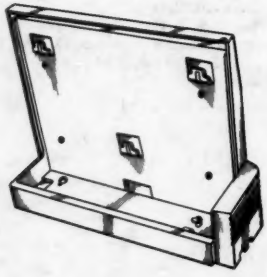


313,588
SUPPORT FOR SUSPENDING AN ELECTRICAL POWER SUPPLY TRACK
Bruno Gecchelin, Milan, Italy, assignor to iGuzzini Illuminazione S.p.A., Recanati, Italy
Filed Mar. 7, 1988, Ser. No. 164,631
Claims priority, application Italy, Sep. 15, 1987, 22337/87[U]
Term of patent 14 years
U.S. Cl. D13—154

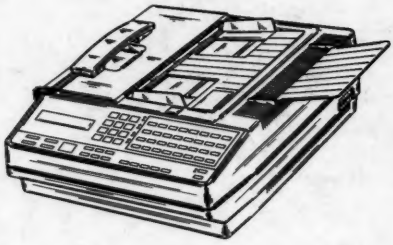
313,589
HAND OPERATED COMPUTER DISPLAY CONTROL
John K. Martinelli, and Timothy C. Barry, both of Fremont, Calif., assignors to Microspeed, Inc., Fremont, Calif.
Filed Jul. 24, 1987, Ser. No. 77,558
Term of patent 14 years
U.S. Cl. D14—114



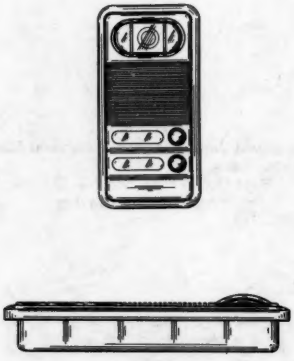
313,590
MOUNTING BRACKET FOR A COMPACT OPTICAL SCANNER
Theodore H. Schorr, Eugene, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed Jan. 5, 1989, Ser. No. 293,865
Term of patent 14 years
U.S. Cl. D14—114



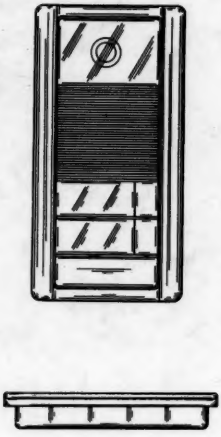
313,591
FACSIMILE MACHINE
Yoshihisa Oie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 25, 1988, Ser. No. 160,490
Claims priority, application Japan, Aug. 26, 1987, 62-34675
Term of patent 14 years
U.S. Cl. D14—118



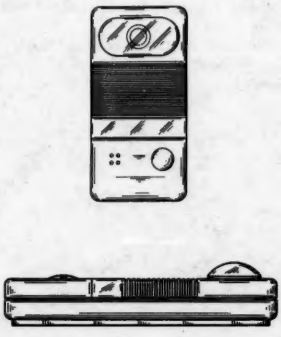
313,592
EXTERNAL UNIT FOR INTERCOM
Shinichi Morooka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 26, 1988, Ser. No. 149,056
Claims priority, application Japan, Jul. 30, 1987, 62-31284
Term of patent 14 years
U.S. Cl. D14—159



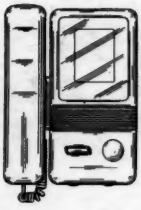
313,593
OUTSIDE UNIT FOR INTERCOM
Shinichi Morooka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 27, 1988, Ser. No. 149,205
Claims priority, application Japan, Jul. 30, 1987, 62-31282
Term of patent 14 years
U.S. Cl. D14—159



313,594
EXTERNAL UNIT FOR INTERCOM
Shinichi Morooka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 26, 1988, Ser. No. 149,057
Claims priority, application Japan, Jul. 30, 1987, 62-31278
Term of patent 14 years
U.S. Cl. D14—159

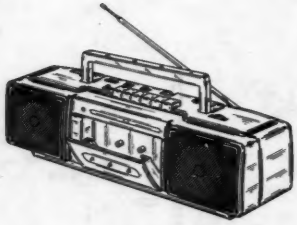


313,595
INSIDE UNIT FOR INTERCOM
Shinichi Morooka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 27, 1988, Ser. No. 149,208
Claims priority, application Japan, Jul. 30, 1987, 62-31279
Term of patent 14 years
U.S. Cl. D14—159

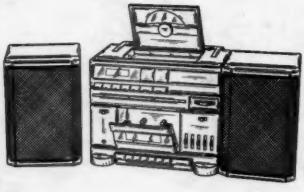


313,596
COMBINED TAPE PLAYER AND TUNER
Hideki Tsuboi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 5, 1988, Ser. No. 228,568
Claims priority, application Japan, Feb. 10, 1988, 63-4903
Term of patent 14 years
U.S. Cl. D14—163

313,597
COMBINED TAPE RECORDER AND RADIO
Makoto Takimoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 20, 1988, Ser. No. 247,092
Claims priority, application Japan, Mar. 22, 1988, 63-11582
Term of patent 14 years
U.S. Cl. D14—163

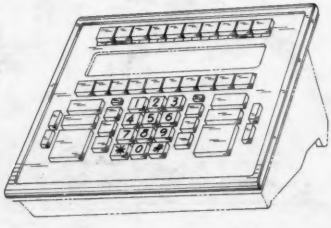


313,598
COMBINED DIGITAL AUDIO DISC PLAYER, RADIO AND TAPE RECORDER
Tatsuo Mori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 14, 1988, Ser. No. 270,496
Claims priority, application Japan, Jun. 2, 1988, 63-21768
Term of patent 14 years
U.S. Cl. D14—163

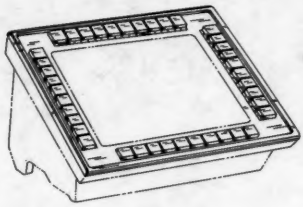


313,599
COMBINED LOUDSPEAKER CABINET, SOUND REFLECTOR AND SUPPORT BASE
Andrew E. Flanders, 570 N. 10th Ave., Cornelius, Oreg. 97113
Division of Ser. No. 66,796, Jun. 25, 1987. This application Apr. 9, 1990, Ser. No. 506,659
Term of patent 14 years
U.S. Cl. D14—214

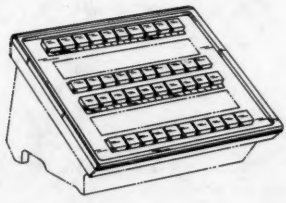
313,600
TELEPHONE CONTROL MODULE
Edward W. Weber, Norwalk, Conn., assignor to Contel IPC, Inc., Stamford, Conn.
Filed Jun. 23, 1988, Ser. No. 210,642
Term of patent 14 years
U.S. Cl. D14—241



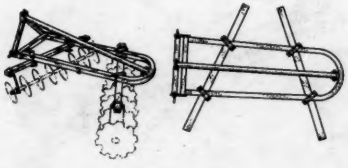
313,601
FORTY-BUTTON AUXILIARY TELEPHONE MODULE WITH SINGLE SCREEN
Edward W. Weber, Norwalk, Conn., assignor to Contel IPC, Inc., Stamford, Conn.
Filed Jun. 23, 1988, Ser. No. 210,644
Term of patent 14 years
U.S. Cl. D14—241



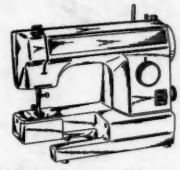
313,602
FORTY BUTTON AUXILIARY TELEPHONE MODULE
Edward W. Weber, Norwalk, Conn., assignor to Contel IPC, Inc., Stamford, Conn.
Filed Jun. 23, 1988, Ser. No. 211,401
Term of patent 14 years
U.S. Cl. D14—241

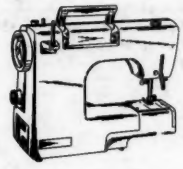


313,603
ADJUSTABLE OFFSET DISC HARROW FRAME
Thomas I. Burenga, Litchfield, Ill., assignor to Worksaver, Inc., Litchfield, Ill.
Filed Nov. 16, 1987, Ser. No. 120,805
Term of patent 14 years
U.S. Cl. D15—11

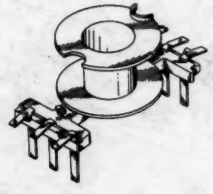


313,604
SEWING MACHINE
Ichirou Shibayama, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed May 17, 1988, Ser. No. 195,634
Claims priority, application Japan, Nov. 20, 1987, 62-47512
The portion of the term of this patent subsequent to Jan. 8, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—70

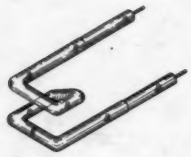




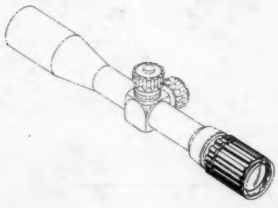
313,605
TERMINAL FITTED BOBBIN
Kiyokazu Saito, and Hiraku Imaizumi, both of Chiba, Japan, assignors to TDK Electronics Co., Ltd., Japan
Filed Nov. 2, 1988, Ser. No. 265,930
Claims priority, application Japan, May 6, 1988, 63-60001[U]
Term of patent 14 years
U.S. Cl. D15—78



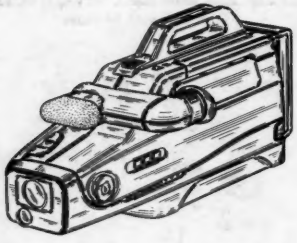
313,606
ULTRAVIOLET BULB
Michael J. Roth, Vernon Hills, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed Jan. 11, 1988, Ser. No. 142,775
Term of patent 14 years
U.S. Cl. D26—2



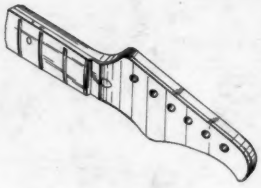
313,607
OCULAR HOUSING FOR A RIFLESCOPE
Sidney D. Moore, Claremont, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Jul. 1, 1988, Ser. No. 214,633
Term of patent 14 years
U.S. Cl. D16—132



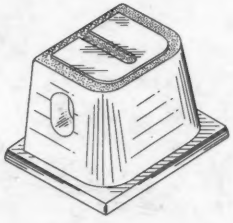
313,608
COMBINED CAMERA AND VIDEO TAPE RECORDER
Hiroshi Ooi, and Seiji Kurokawa, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 20, 1989, Ser. No. 325,500
Claims priority, application Japan, Oct. 7, 1988, 63-39578
Term of patent 14 years
U.S. Cl. D16—202



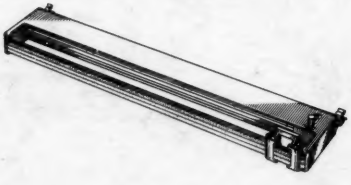
313,609
GUITAR HEAD
Andrew F. Mulroy, Jr., Jamaica Estates, N.Y., assignor to 48th St. Custom Guitars, New York, N.Y.
Filed Nov. 18, 1987, Ser. No. 122,005
Term of patent 14 years
U.S. Cl. D17—20



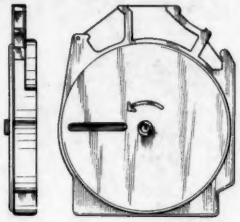
313,610
MINI DRUM LUG
James F. Starr, San Antonio, Tex., assignor to Drum City, Inc., San Antonio, Tex.
Filed Dec. 22, 1986, Ser. No. 945,323
Term of patent 14 years
U.S. Cl. D17—22



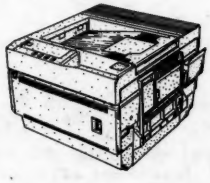
313,611
INK RIBBON CARTRIDGE
Takeshi Yokoi, Kakamigahara, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Feb. 25, 1988, Ser. No. 160,097
Claims priority, application Japan, Sep. 16, 1987, 62-37791
Term of patent 14 years
U.S. Cl. D18—12



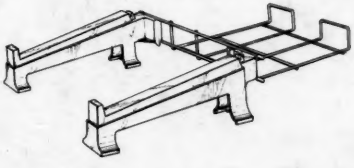
313,612
RIBBON CASSETTE FOR AN IMPRINTER OR THE LIKE
Stephane Roussopoulos, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon-les-Bains, Switzerland
Filed Nov. 25, 1986, Ser. No. 934,929
Claims priority, application Int'l Pat. Institute, May 26, 1986, DM/006 966
Term of patent 14 years
U.S. Cl. D18—12



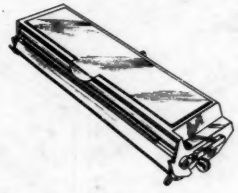
313,613
PRINTER
Shunichi Nagaya, Yokohama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jan. 12, 1987, Ser. No. 2,247
Claims priority, application Japan, Nov. 5, 1986, 61-43539
Term of patent 14 years
U.S. Cl. D18—13



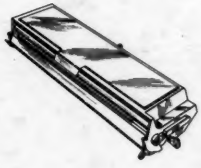
313,614
ADJUSTABLE PRINTER STAND
H. Charles Hassel, Los Angeles, and Donald Westland, Venice, both of Calif., assignors to MicroComputer Accessories Inc., Los Angeles, Calif.
Filed Sep. 8, 1987, Ser. No. 93,907
Term of patent 14 years
U.S. Cl. D18—23



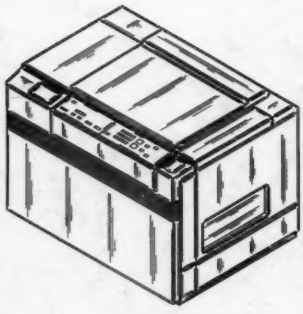
313,615
DEVELOPING UNIT FOR COPIERS
Hiroyuki Tokuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1989, Ser. No. 296,760
Claims priority, application Japan, Jul. 13, 1988, 63-28137
The portion of the term of this patent subsequent to Jan. 8, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—36



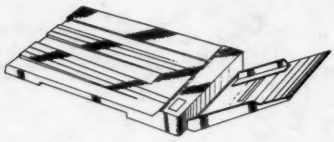
313,616
DEVELOPING UNIT FOR COPIERS
Hiroyuki Tokuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1989, Ser. No. 296,761
Claims priority, application Japan, Jul. 13, 1988, 63-28136
The portion of the term of this patent subsequent to Jan. 8, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—36



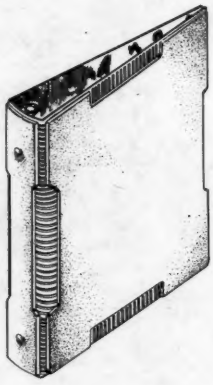
313,617
COPYING MACHINE
Mikio Kosako, and Kanji Mizusugi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 11, 1988, Ser. No. 216,994
Term of patent 14 years
U.S. Cl. D18—37



313,618
FEEDER FOR ELECTRONIC COPYING MACHINE
Mikio Kosako; Ritsuko Makihara, and Yoichi Tatsuta, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 30, 1987, Ser. No. 44,453
Claims priority, application Japan, Nov. 5, 1986, 61-43761
Term of patent 14 years
U.S. Cl. D18—42



313,619
BINDER
Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 231,559, Aug. 12, 1988, Pat. No. 4,856,867. This application Sep. 22, 1988, Ser. No. 252,970
Term of patent 14 years
U.S. Cl. D19—27



313,620
TWIN-NIBBED MARKING PEN
Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1987, Ser. No. 134,522
Claims priority, application Japan, Jun. 19, 1987, 62-25010
The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—48

313,621

TWIN-NIBBED MARKING PEN

Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,523

Claims priority, application Japan, Jun. 19, 1987, 62-25011

The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D19—48

313,622

TWIN-NIBBED MARKING PEN

Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,524

Claims priority, application Japan, Jun. 19, 1987, 62-25013

The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D19—48

313,623

TWIN-NIBBED MARKING PEN

Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,897

Claims priority, application Japan, Jun. 19, 1987, 62-25012

The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D19—48

313,624

SHAFT FOR A WRITING IMPLEMENT

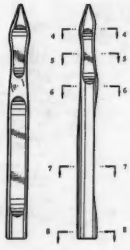
Andrej Ferjan, Ljubljana, Yugoslavia, assignor to Vili Brandt, Ljubljana, Yugoslavia

Filed Apr. 9, 1987, Ser. No. 36,400

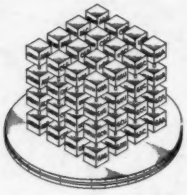
Claims priority, application Yugoslavia, Oct. 9, 1986, M 614/86

Term of patent 14 years

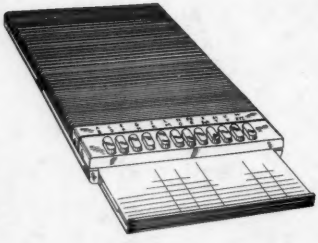
U.S. Cl. D19—55



313,625
DISPLAY DEVICE FOR ILLUSTRATING SCIENTIFIC CODES, AND CORRESPONDING HEXAGRAMS
Johnson F. Yan, and Suzie C. Yan, both of 3801 SW. 326th St., Federal Way, Wash. 98023
Filed Dec. 18, 1987, Ser. No. 134,907
Term of patent 14 years
U.S. Cl. D19—62

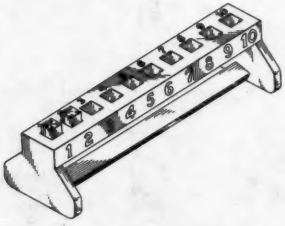


313,626
TELEPHONE INDEX
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Confon AG, Rheineck, Switzerland
Filed Mar. 27, 1987, Ser. No. 32,082
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 8626166[U]; Mar. 20, 1987, URA 317/87
Term of patent 14 years
U.S. Cl. D19—76

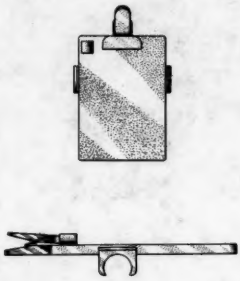


313,627
COMBINED BOOKMARK AND PHOTOGRAPH HOLDER
Felix R. Diaz, 105 Elizabeth Blackwell St., Syracuse, N.Y. 13210
Filed Sep. 14, 1988, Ser. No. 244,460
Term of patent 14 years
U.S. Cl. D19—34

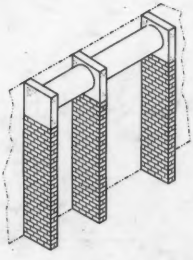
313,628
COUNTING TOY
Thomas L. Delcambre, P.O. Box 851, New Iberia, La. 70561-0851
Filed May 23, 1988, Ser. No. 197,411
Term of patent 14 years
U.S. Cl. D19—59



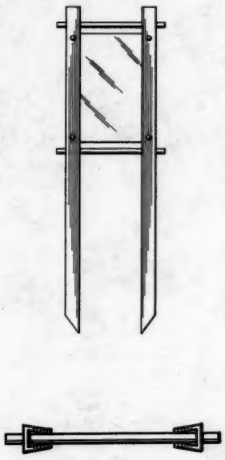
313,629
CLIPBOARD FOR A SHOPPING CART PUSH BAR
Ronald J. Hoffman, Collierville, Tenn., assignor to Guardsman Products, Inc., Grand Rapids, Mich.
Filed Feb. 1, 1988, Ser. No. 151,251
Term of patent 14 years
U.S. Cl. D19—88



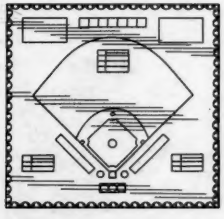
313,630
BARREL SIGN
Joel M. Anderson, North Oaks, and Gregory G. Hollenkemp, St. Paul, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky.
Filed Mar. 18, 1988, Ser. No. 169,732
Term of patent 14 years
U.S. Cl. D20—10



313,631
SEED PACKET HOLDER
Colleen B. White, P.O. Box 912, Hadlock, Wash. 98339
Filed Sep. 14, 1988, Ser. No. 244,456
Term of patent 14 years
U.S. Cl. D20—41

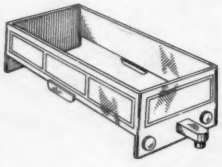


313,632
GAME BOARD
Stephen G. Guerin, 23 Ashcroft Court, Woodbridge, Ontario, L4L 1H1, Canada
Filed Jul. 30, 1987, Ser. No. 79,782
Term of patent 14 years
U.S. Cl. D21—28



313,633
SCOOTER
Darold B. Cummings, 5320 W. 124th Pl., Hawthorne, Calif. 90250
Filed May 2, 1988, Ser. No. 189,731
Term of patent 14 years
U.S. Cl. D21—81

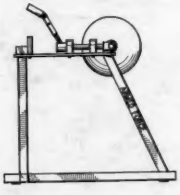
313,634
TOY RAILROAD FREIGHT CAR
Herbert C. Weiland, Rancho Palos Verdes, Calif., assignor to Clover Toys, Inc., LaMirada, Calif.
Filed Jun. 20, 1988, Ser. No. 208,543
Term of patent 14 years
U.S. Cl. D21—129



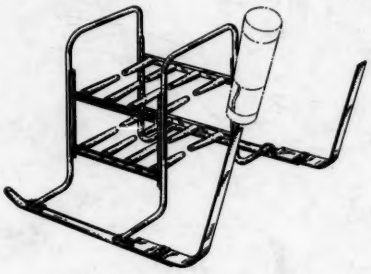
313,635
FIGURE TOY
Thomas Semeraro, 4 Leroy Rd., Burlington, Mass. 01803
Filed Jan. 19, 1988, Ser. No. 145,187
Term of patent 14 years
U.S. Cl. D21—148

313,636
SEA BABIES DOLL
Cathleen Arone, 318 Lower County Rd., Dennisport, Miss., and Louise Johnson, 19 Paine Rd., S. Yarmouth, Mass. 02664
Filed Feb. 5, 1988, Ser. No. 154,515
Term of patent 14 years
U.S. Cl. D21—171

313,637
UPPER ARM PHYSICAL EXERCISER
Ted Pleasant, Rt. 1, Box 222-B5, Angier, N.C. 27501
Filed Jul. 7, 1988, Ser. No. 216,239
Term of patent 14 years
U.S. Cl. D21—190

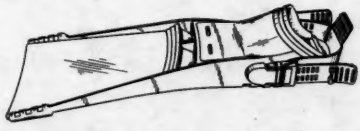


313,638
FOOTBALL TRAINING AID
Neil F. Gilman, Glastonbury, Conn., assignor to Marty Gilman Incorporated, Gilman, Conn.
Filed Oct. 24, 1988, Ser. No. 261,462
Term of patent 14 years
U.S. Cl. D21—199



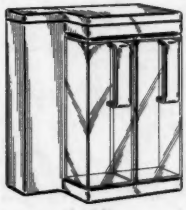
313,639
KICKING TOY PROJECTILE
Gary Cobb, San Pedro, Calif., assignor to Anthony Domenico, Moreno Valley, Calif.
Filed May 17, 1988, Ser. No. 194,729
Term of patent 14 years
U.S. Cl. D21—203

313,640
SWIM FIN
Shohji Fujiwara, Tokyo, Japan, assignor to Tabata Co. Ltd., Tokyo, Japan
Filed Jul. 28, 1987, Ser. No. 78,702
Claims priority, application Japan, Feb. 18, 1987, 62-6113
Term of patent 14 years
U.S. Cl. D21—239

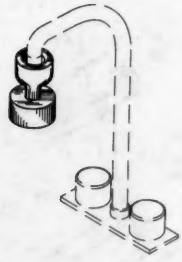


313,641
COCKROACH TRAP
Vincenzo Caprioli, Pavia, Italy, assignor to Agrimont S.p.A., San Martino Siccomario, Italy
Division of Ser. No. 244,393, Sep. 15, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 395,559
Claims priority, application Italy, Sep. 16, 1987, 21920 A/87
Term of patent 14 years
U.S. Cl. D22—119

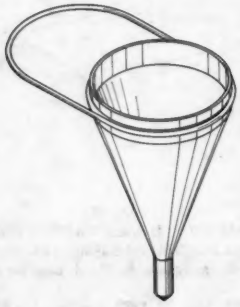
313,642
COUNTERTOP HOME WATER PURIFIER
Thomas Carrano, Fairfield, and Raymond Petrucci, Middlebury, both of Conn., assignors to Gund Incorporated, Meriden, Conn.
Filed Dec. 14, 1988, Ser. No. 284,475
Term of patent 14 years
U.S. Cl. D23—207



313,643
PORTABLE WATER FILTER
Robert S. Luzenberg, Jr., 135 First St. East, Unit 301, Tierra Verde, Fla. 33715
Continuation-in-part of Ser. No. 936,376, Dec. 1, 1986, Pat. No. 296,352. This application May 13, 1987, Ser. No. 48,921
Term of patent 14 years
U.S. Cl. D23—209

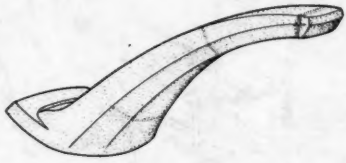


313,644
FUNNEL FOR WATERING PLANTS
Johnnie L. Hooks, 2344 E. 17 St. Apt. #2, Oakland, Calif. 94601, and Elizabeth Turner, 2208 Dickens St., Killeen, Tex. 76543
Filed Nov. 18, 1987, Ser. No. 122,345
Term of patent 14 years
U.S. Cl. D23—212



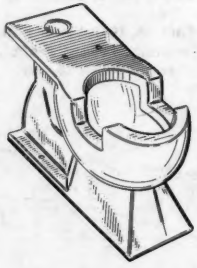
313,645
SHOWER HEAD OR THE LIKE
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1989, Ser. No. 297,913
Term of patent 14 years
U.S. Cl. D23—213

313,646
SPOUT
Timothy S. Selberg, Auburn Hills, and Ralph H. Erickson, Mt. Clemens, both of Mich., assignors to Brass-Craft Manufacturing Company, Southfield, Mich.
Filed Oct. 26, 1987, Ser. No. 112,121
Term of patent 14 years
U.S. Cl. D23—255

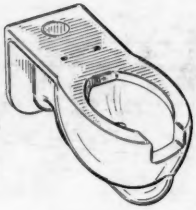


313,647
BATHING ENCLOSURE SHELL
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 12, 1987, Ser. No. 2,252
Term of patent 14 years
U.S. Cl. D23—275

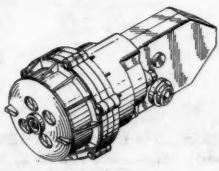
313,648
TOILET BOWL
Robert H. Kimes, Hickory Hill Box 33, Freeport, Ill. 61032
Filed Sep. 5, 1989, Ser. No. 402,248
Term of patent 14 years
U.S. Cl. D23—295



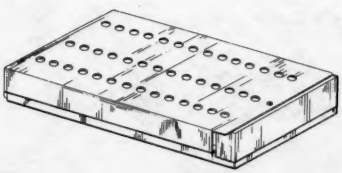
313,649
TOILET BOWL
Robert H. Kimes, Hickory Hill Box 33, Freeport, Ill. 61032
Filed Aug. 30, 1989, Ser. No. 400,746
Term of patent 14 years
U.S. Cl. D23—300



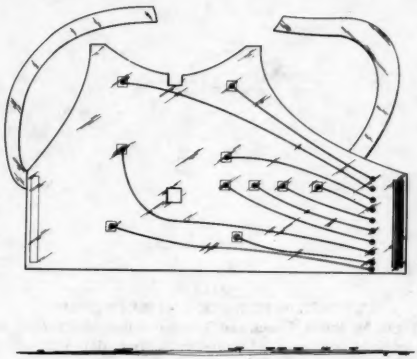
313,650
ROTARY ACTUATOR FOR A DAMPER
Larry G. Odegaard, Thief River Falls, Minn., assignor to Kreuter Mfg. Co., Inc., New Paris, Ind.
Filed Dec. 21, 1987, Ser. No. 135,755
Term of patent 14 years
U.S. Cl. D23—386



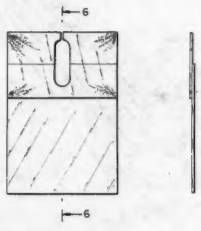
313,651
COMBINED MEDICAL INSTRUMENTS CASE AND STERILIZER
Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291
Filed Nov. 16, 1987, Ser. No. 121,598
Term of patent 14 years
U.S. Cl. D24—9



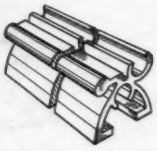
313,652
EKG SENSOR VEST
Thomas G. Lavine, 2496 Angelo Dr., Los Angeles, Calif. 90077
Filed Nov. 6, 1987, Ser. No. 118,339
Term of patent 14 years
U.S. Cl. D24—17



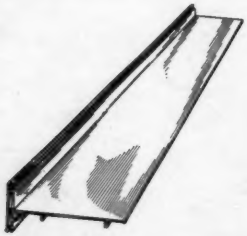
313,653
IV DRESSING
William J. Ward, and Joanne Shorthouse, both of Hull, England, assignors to Smith & Nephew Research Limited, England
Continuation-in-part of Ser. No. 120,798, Nov. 13, 1987, abandoned. This application Dec. 7, 1987, Ser. No. 131,383
Claims priority, application United Kingdom, May 15, 1987, 1042220; May 15, 1987, 1042221
Term of patent 14 years
U.S. Cl. D24—52



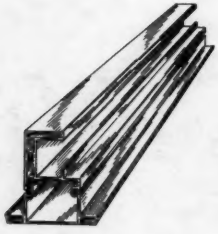
313,654
EXTRUSION FOR SHELVING AND THE LIKE
Irving W. Shell, Pompano Beach, Fla., assignor to Friedkin Industries, Inc., Boca Raton, Fla.
Filed Feb. 1, 1988, Ser. No. 150,705
Term of patent 14 years
U.S. Cl. D25—119



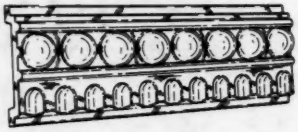
313,655
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,185
Term of patent 14 years
U.S. Cl. D25—124



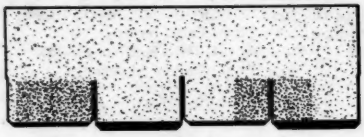
313,656
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,134
Term of patent 14 years
U.S. Cl. D25—124



313,657
CERAMIC TILE
Paloma Picasso, Paris, France, assignor to Villeroy & Boch AG, Mettlach, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 191,234
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 7AR111/87
Term of patent 14 years
U.S. Cl. D25—138



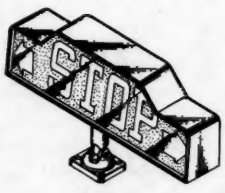
313,658
SHINGLE
Michael J. Noone, Wayne, Pa., assignor to CertainTeed Corporation, Valley Forge, Pa.
Filed Feb. 9, 1989, Ser. No. 308,394
Term of patent 14 years
U.S. Cl. D25—139



313,659
FLUORESCENT LAMP OR THE LIKE
Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Oct. 11, 1988, Ser. No. 255,695
Term of patent 14 years
U.S. Cl. D26—3

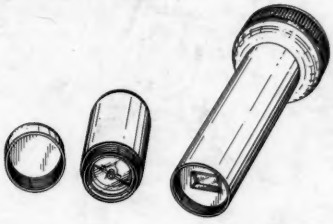
313,660
CANDLE ANCHOR
William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.
Filed May 26, 1987, Ser. No. 54,280
Term of patent 14 years
U.S. Cl. D26—9

313,661
COMBINED AUXILIARY VEHICLE BRAKE SIGNAL LIGHT AND TURN SIGNAL
Weui Y. Kang, 229 N. Manhattan Pl., Apt. 4, Los Angeles, Calif. 90004
Filed Apr. 3, 1987, Ser. No. 35,166
Term of patent 14 years
U.S. Cl. D26—31

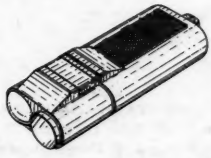


313,662
FLASHLIGHT FOR HANDBAGS OR SIMILAR ARTICLE
Richard Caires, 45 W. 60th St., New York, N.Y. 10023
Filed Jul. 1, 1987, Ser. No. 70,866
Term of patent 14 years
U.S. Cl. D26—37

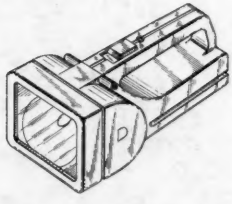
313,663
COMBINED TORCH, COMPASS AND DIGITAL CLOCK
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Hong Kong
Filed Aug. 2, 1988, Ser. No. 227,359
Claims priority, application United Kingdom, Feb. 5, 1988, 1048296
Term of patent 14 years
U.S. Cl. D26—38



313,664
ELECTRIC TORCH
Andrew Gibson, St Neots, England, assignor to Vulcan UK Company, United Kingdom
Filed Feb. 10, 1988, Ser. No. 154,630
Claims priority, application United Kingdom, Aug. 27, 1987, 1044459
Term of patent 14 years
U.S. Cl. D26—42

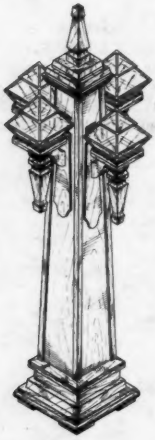


313,665
RECHARGEABLE SPOTLIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jun. 7, 1988, Ser. No. 203,146
Claims priority, application United Kingdom, Dec. 8, 1987, 1046932
Term of patent 14 years
U.S. Cl. D26—44



313,666
COMBINATION LAMP AND TAPE PLAYER
Vincent A. D'Alleva, Hoffman Estates, Ill., assignor to Monogram Models, Inc., Des Plaines, Ill.
Filed Feb. 24, 1988, Ser. No. 159,654
Term of patent 14 years
U.S. Cl. D26—52

313,667
BOULEVARD TORCHÈRE
Diana M. Horne, 10030 Lake Occoquan Dr., Manassas, Va. 22111, assignor to Diana M. Horne, Manassas, Va.
Filed Feb. 4, 1988, Ser. No. 152,062
Term of patent 14 years
U.S. Cl. D26—69

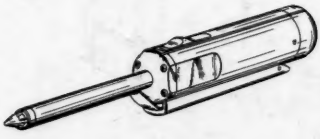


313,668
LIGHTING FIXTURE OR SIMILAR ARTICLE
David H. Porter, Chagrin Falls, Ohio, assignor to L. D. Kichler Co., Cleveland, Ohio
Filed Jul. 27, 1988, Ser. No. 224,893
Term of patent 14 years
U.S. Cl. D26—87

313,669
LAMP
Robert A. Sonneman, New York, N.Y., assignor to Sonneman Design Group, Inc., Long Island City, N.Y.
Filed Jul. 25, 1988, Ser. No. 224,000
Term of patent 14 years
U.S. Cl. D26—109

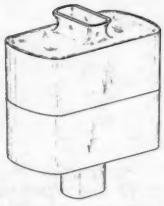
313,670
DISPOSABLE HANDLE FOR A HOSPITAL SURGERY ROOM LIGHT FIXTURE OR THE LIKE
John M. Barron, Granda Hills, Calif.; Robert T. Horan, Tucson, Ariz.; Moshe M. Hoftman, Northridge, Calif.; William L. Noack, Camarillo, Calif., and Dan Sandel, Tarzana, Calif., assignors to Devon Industries, Inc., Chatsworth, Calif.
Filed Jul. 20, 1988, Ser. No. 221,772
Term of patent 14 years
U.S. Cl. D26—113

313,671
HAIR IRON
Masaharu Ichikawa, 44-11, Matsubara, 1-chome, Setagayaku, Tokyo, Japan
Filed Oct. 20, 1988, Ser. No. 260,364
Claims priority, application Japan, Apr. 26, 1988, 63-17022
Term of patent 14 years
U.S. Cl. D28—35

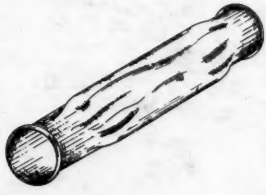


313,672
SAFETY RAZOR
Robert Tiegs, 5300 Hwy., Rte. 4, Janesville, Wis. 53545
Filed Sep. 14, 1988, Ser. No. 244,261
Term of patent 14 years
U.S. Cl. D28—46

313,673
FILTERED RESUSCITATION MOUTHPIECE ASSEMBLY WITH SEPARABLE OPERATOR AND PATIENT MOUTHPIECE STRUCTURES
Louis J. Karcher, 213 McKinley Pl., Ridgewood, N.J. 07450
Filed Jun. 27, 1988, Ser. No. 212,424
Term of patent 14 years
U.S. Cl. D29—7

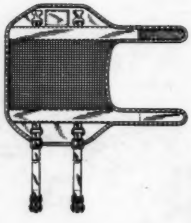


313,674
SLEEVE GARMENT
Charles W. Sharpe, P.O. Box 938, North Myrtle Beach, S.C. 29597
Filed Jan. 19, 1988, Ser. No. 145,184
Term of patent 14 years
U.S. Cl. D29—20



313,675
BIRD FEEDER
Henry G. Rhyne, III, Gastonia, N.C., assignor to Rhyne Floral Supply Manufacturers Co., Inc., Gastonia, N.C.
Filed Sep. 22, 1987, Ser. No. 99,515
Term of patent 14 years
U.S. Cl. D30—125

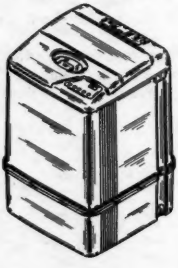
313,676
PROTECTIVE GARMENT FOR PETS
Michael Indursky, Maplewood, N.J., and John Golomb, Brooklyn, N.Y., assignors to Qualitico, Inc., Bronx, N.Y.
Filed Oct. 28, 1987, Ser. No. 113,732
Term of patent 14 years
U.S. Cl. D30—145



313,677
COMBINED DOG HARNESS AND PACKS
Darrel L. Hammon, 89 W. Gettysburg, and Roger D. Nelson, 1704 Colorado, both of Boise, Id. 83706
Filed Jul. 14, 1987, Ser. No. 73,211
Term of patent 14 years
U.S. Cl. D30—152

313,678
DISHWASHER
Kiminori Yamaguchi, and Tazuo Orihara, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 13, 1987, Ser. No. 49,606
Claims priority, application Japan, Nov. 14, 1986, 61-45137
Term of patent 14 years
U.S. Cl. D32—2

313,679
WASHING MACHINE
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 23, 1989, Ser. No. 302,212
Claims priority, application Japan, Aug. 12, 1988, 63-32436
Term of patent 14 years
U.S. Cl. D32—6

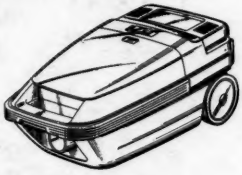


313,680

ELECTRIC VACUUM CLEANER

Fumioki Ichihara, Kyoto, and Isamu Shinozaki, Toyono, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1989, Ser. No. 321,745
Claims priority, application Japan, Dec. 16, 1988, 63-49290
Term of patent 14 years
U.S. Cl. D32—21

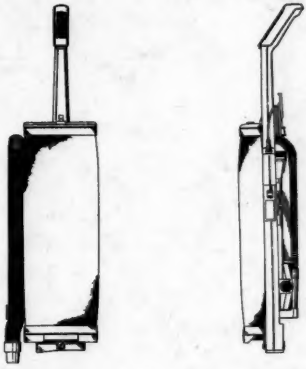


313,681

UPPER PORTION OF A VACUUM CLEANER

Darwin T. McKnight, Louisville, Ohio, assignor to The Hoover Company, North Canton, Ohio

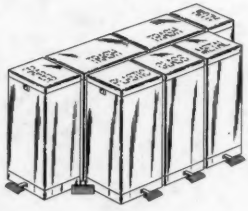
Filed Dec. 27, 1989, Ser. No. 458,791
Term of patent 14 years
U.S. Cl. D32—22



313,682
FLOOR SCRAPER
Leo P. Marin, 2228 Deep Grove, Rowland Heights, Calif. 91748, and Lawrence J. Hernandez, 2655 Altamira Dr., Covine, Calif. 91792
Filed Feb. 13, 1989, Ser. No. 309,722
Term of patent 14 years
U.S. Cl. D32—49

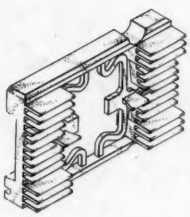
313,683
COMBINED IRON AND STAND THEREFOR
Tien-Lai Chen, 4 Fl., No. 20, Min Chuan West Road, Taipei, Taiwan
Filed Dec. 4, 1989, Ser. No. 445,333
Term of patent 14 years
U.S. Cl. D32—68

313,684
MULTI-COMPARTMENT TRASH RECEPTACLE
Deborah D. Ray, 4364 Kamlogo Ave., San Diego, Calif. 97117
Filed Oct. 17, 1988, Ser. No. 258,971
Term of patent 14 years
U.S. Cl. D34—11

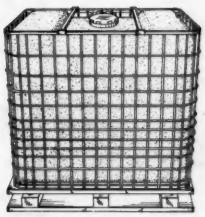


313,685
SWITCH FOR AN OVERHEAD RAIL CONVEYOR
Henry Johansson, Älvsjö ; Tord Eriksson, and Arne Berglund, both of Nyköping, all of Sweden, assignors to Alfa-Laval Agri Scandinavia AB, Tumba, Sweden
Filed Jun. 6, 1988, Ser. No. 202,941
Term of patent 14 years
U.S. Cl. D34—29

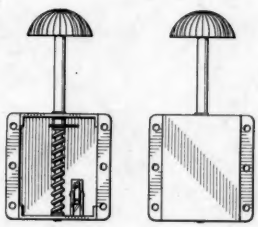
313,686
INTEGRATED CIRCUIT CHIP CARRIER
Joseph I. Vitek, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 24, 1986, Ser. No. 934,090
Term of patent 14 years
U.S. Cl. D34—40



313,687
COMBINED CONTAINER AND PALLET
Benoît Cheval, Saverne; Pierre Pfeiffer, and Paul Sigwalt, both of Drulingen, all of France, assignors to Sotralentz S.A. Nouvelle Societe, Drulingen, France
Filed Jul. 6, 1987, Ser. No. 70,113
Claims priority, application France, Jan. 5, 1987, 870018
The portion of the term of this patent subsequent to Sep. 13, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—42



313,688
MAIL BOX INDICATOR FLAG ATTACHMENT
Jack La Fountain, 9189 Douglas Ave., Kalamazoo, Mich. 49007, and Basil Doubbestien, 336 Washington St., Otsego, Mich. 49078
Filed Oct. 31, 1988, Ser. No. 264,686
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JANUARY, 1991

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & CIE GmbH: *See—*
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A/S E. Danberg Group: *See—*
Skillius, Hans, 4,982,863, Cl. 220-318.000.

A.T. & G. Company, Inc.: *See—*
Bonner, Ben V., 4,982,625, Cl. 81-53.200.

AAI Corporation: *See—*
Scheve, David M.; and Schnepfe, Robert W., Jr., 4,982,663, Cl. 102-251.000.

AB Volvo: *See—*
Thoreson, Torsten, 4,982,619, Cl. 74-473.00R.

Abarca, Juan R. Q.: *See—*
Haag, Roberto B.; da Silva, Jaime C.; Abarca, Juan R. Q.; and do Coutto Filho, Odyr, 4,983,693, Cl. 526-124.000.

Abbey, Jay E. Beam hanger for precast foundations. 4,982,548, Cl. 52-702.000.

Abbott Laboratories: *See—*
Stewart, James L.; Ketchum, Susan K.; and Stumpf, Robert J., 4,983,529, Cl. 436-512.000.

Abboud, Joseph G. Irritant ejecting stun gun. 4,982,645, Cl. 89-1.110.

Abdalla, Mohamed I.; Hope, Lawrence L.; and Fohl, Timothy, to GTE Products Corporation. Edge breakdown protection in ACEL thin film display. 4,983,880, Cl. 313-506.000.

Abdoo, David G.; and Mayer, Dale J., to Compaq Computer Corporation. Memory block address determination circuit. 4,984,213, Cl. 365-230.300.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Ignition timing control system for an engine. 4,982,712, Cl. 123-424.000.

Abe, Masakazu, to Laurel Bank Machines Co., Ltd. Bill discriminating apparatus. 4,984,280, Cl. 382-7.000.

Abe, Mitsuhiko. Clip-carrying bookmarker. 4,982,685, Cl. 116-237.000.

Abrams, Martin: *See—*
Katz, Murray; Bonk, Stanley P.; Maricle, Donald L.; and Abrams, Martin, 4,983,472, Cl. 429-38.000.

Absil, Robert P. L.; Angevine, Philip J.; Bundens, Robert G.; and Herbst, Joseph A., to Mobil Oil Corp. Octane improvement in catalytic cracking and cracking catalyst composition therefor. 4,983,276, Cl. 208-120.000.

Ace Archers, Inc.: *See—*
Haggard, Alan J.; and Young, Christopher A., 4,982,719, Cl. 124-89.000.

Acustar, Inc.: *See—*
Betterton, Joseph T.; Glover, Alfred H.; and McKee, Thomas S., 4,982,607, Cl. 73-725.000.
Glover, Alfred H.; Betterton, Joseph T.; and Hepler, Bruce, 4,982,847, Cl. 211-41.000.

Adachi, Hideki; Tomosada, Masahiro; Suzuki, Tadashi; and Ohki, Naoyuki, to Canon Kabushiki Kaisha. Copying apparatus having an area designating function. 4,984,020, Cl. 355-218.000.

Adam, Yossi: *See—*
Landa, Benzion; Lavon, Amiran; Pinhas, Hanna; and Adam, Yossi, 4,984,025, Cl. 355-274.000.

Adams Rite Manufacturing Company: *See—*
Gressett, Charles A., Jr.; and Smith, Gregg L., 4,982,986, Cl. 292-336.300.

Adamski, Joseph R.; and Coates, Donald A., to Raytheon Company. Fluid level sensor and controller. 4,982,606, Cl. 73-304.00C.

Adell, Loren S., to Adell, Loren S.; and Adell, Michael. Method of making an orthodontic appliance. 4,983,334, Cl. 264-16.000.

Adell, Michael: *See—*
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Adir et Compagnie: *See—*
Peglion, Jean L.; Gargouil, Yves M.; and Vilaine, Jean P., 4,983,740, Cl. 546-321.000.

Advanced Micro Devices, Inc.: *See—*
Dujari, Vineet, 4,984,151, Cl. 364-200.000.

Advanced Products and Technologies, Inc.: *See—*
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Advanced Technology Materials, Inc.: *See—*
Tom, Glenn M.; and Brown, Duncan W., 4,983,363, Cl. 422-180.000.

Aero Marine Engineering, Inc.: *See—*
Havins, Felton H., 4,982,924, Cl. 248-288.500.

Aerojet General Corporation: *See—*
Huang, Der-Shing; and Rindone, Renato R., 4,983,734, Cl. 544-194.000.

Aeropspatiale Societe Nationale Industrielle: *See—*
Derenne, Philippe; Louis, Michel; Camous, Jacques; and Tarreau, Michel, 4,983,028, Cl. 350-609.000.

Agarwal, Mahesh: *See—*
Dadson, Joseph E.; and Agarwal, Mahesh, 4,983,161, Cl. 604-28.000.

Agarwal, Pawan K., to Exxon Research & Engineering Company. Polymer complex adhesive compositions. 4,983,652, Cl. 524-66.000.

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Sakamoto, Hiroshi; Yamamoto, Mitsuru; and Ohya, Hitoshi, 4,982,906, Cl. 241-179.000.
Takeya, Naoya; Honma, Kazuhiro; and Matsuda, Kiyofumi, 4,983,004, Cl. 350-3.660.

Agostini, Louis P. C., to Staar S. A. Dual drive changer for records. 4,984,228, Cl. 369-37.000.

Agrawal, Rakesh: *See—*
Hopkins, Jeffrey A.; McGuinness, Roger M.; Agrawal, Rakesh; and Feldman, Steven L., 4,983,194, Cl. 62-22.000.

Ahlers, Egon, to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft. Method and filling element for dispensing liquid into containers. 4,982,768, Cl. 141-6.000.

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Akagawa, Tomohiko: *See—*
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Akagi, Masanobu: *See—*
Hanatani, Syuichi; Akagi, Masanobu; Nigo, Kouemon; Sugaya, Ritsuo; and Shibuya, Toshiteru, 4,984,154, Cl. 364-200.000.

Akagi, Toshimichi: *See—*
Hashimoto, Takayoshi; Shibata, Masanori; Okimoto, Haruo; Tashima, Seiji; Yamada, Kaoru; Akagi, Toshimichi; Shimizu, Ritsuharu; Yamamoto, Masaru; and Ohmori, Masashi, 4,982,567, Cl. 60-600.000.

Akao, Michitoshi: *See—*
Makino, Kazumasa; Yoshihara, Hideo; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takeshi; Katoh, Tokunori; Morisaki, Hiroshi; Kobayashi, Masanari; and Asai, Shin, 4,984,009, Cl. 355-27.000.
Sakakibara, Kenji; Akao, Michitoshi; Katoh, Tokunori; and Sawaki, Yukichi, 4,984,011, Cl. 355-27.000.

Akashi, Teruo: *See—*
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Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu, Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, to Nissan Motor Company, Limited. Active suspension system with enhanced response characteristics hydraulic circuit. 4,982,979, Cl. 280-707.000.

Akebono Brake Industry Co., Ltd.: *See—*
Maehara, Toshifumi; and Okubo, Satomi, 4,984,164, Cl. 364-426.020.

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Akebono Research and Development Centre Ltd.: *See—*
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Akira, Toshiaki: *See—*
Fukaya, Chikara; Yasuda, Hitoshi; Akira, Toshiaki; Iwai, Masakazu; Okano, Kanemichi; and Yokoyama, Kazumasa, 4,983,584, Cl. 514-54.000.

Akita Electronics Co., Ltd.: *See—*
Miyaoka, Shuuichi; Tamba, Nobuo; Arai, Toshikazu; Higuchi, Hiroshi; and Higuchi, Hisayuki, 4,984,058, Cl. 357-68.000.

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Worrall, Peter W.; and Crossley, Peter W., 4,983,812, Cl. 219-451.000.

Akutsu, Hidezoh; and Yamazaki, Haruo, to Matsushita Electronics Corporation. Fluorescent lamp device. 4,983,888, Cl. 315-242.000.

Akzo N.V.: *See—*
de Groot, Johannes J.; and Sikkens, Paul J., 4,982,861, Cl. 220-89.100.
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Albers, Walter F.; and Beckman, James R., to Albers, Walter F. Method and apparatus for simultaneous heat and mass transfer. 4,982,782, Cl. 165-1.000.

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Henson, Anthony E., 4,982,447, Cl. 2-2.000.

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Alexandru, Lupu: *See—*
Ong, Beng S.; Murti, Dasarao K.; and Alexandru, Lupu, 4,983,482, Cl. 430-59.000.

Alfing, Norman L., to Hughes Aircraft Company. Antenna lamination technique. 4,983,237, Cl. 156-83.000.

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Alfred Teves GmbH: *See—*
Budecker, Ludwig, 4,983,100, Cl. 417-271.000.

Ali, Mir L.; Bateman, John F.; and Man, Ming, to Ferro Corporation. Non plateout molding composition. 4,983,661, Cl. 524-423.000.

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Allen-Bradley Company, Inc.: *See—*
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Allen, Mark D.: *See—*
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Smith, James C.; Allen, R. Wade; and Jex, Henry R., 4,983,125, Cl. 434-258.000.

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Barder, Timothy J.; and DuBois, Philip D., 4,983,369, Cl. 423-338.000.
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Oram, James W.; Hodson, Price R.; and Haake, Paul F., 4,982,605, Cl. 73-204.190.

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Feitelson, Jerald S.; and Maiese, William M., 4,983,525, Cl. 435-320.000.
Wissner, Allan; Green, Kenneth; and Schaub, Robert E., 4,983,592, Cl. 514-92.000.

American Film Technologies, Inc.: *See—*
Sandrew, Barry B., 4,984,072, Cl. 358-81.000.

American Home Products Corporation: *See—*
Malamas, Michael S., 4,983,613, Cl. 514-309.000.
Quagliato, Dominick; and Deininger, David D., 4,983,612, Cl. 513-300.000.

American National Can Company: *See—*
Erb, Roger; Johnson, Robert; and Smith, Richard, 4,983,203, Cl. 65-265.000.

Ammermann, Eberhard: *See—*
Speakman, John-Bryan; Karl, Rudolf; Lorenz, Gisela; Ammermann, Eberhard; Wuerzer, Bruno; Meyer, Norbert; and Ditrich, Klaus, 4,983,587, Cl. 514-63.000.

Amoco Corporation: *See—*
Bodine, John H.; Gallagher, John N.; and Wright, James H., 4,984,220, Cl. 367-68.000.
Warren, Tommy M.; Winters, Warren J.; and Brett, J. Ford, 4,982,802, Cl. 175-57.000.

AMP Incorporated: *See—*
Brown, Thomas E., 4,983,344, Cl. 264-255.000.
Dale, James L.; Miller, Vernon R.; and Roberts, Lincoln E., 4,983,128, Cl. 439-214.000.
Strong, Michael D.; Zimmerman, Charles E.; and Kiapokas, Michael G., 4,982,830, Cl. 198-349.600.
Weidler, Charles H., 4,983,132, Cl. 439-786.000.
Wychulis, William C., 4,983,884, Cl. 315-151.000.

Amrein, John E. Nozzle for a liquid container. 4,982,881, Cl. 222-514.000.

AMSTED Industries Incorporated: *See—*
Farris, Charles J.; Whitlow, Joseph E.; and Sitzes, Paul E., 4,982,473, Cl. 15-256.600.

Analog Devices, Inc.: *See—*
Real, Peter; and Robertson, David H., 4,983,929, Cl. 330-288.000.

Analogic Corporation: *See—*
Dolazza, Enrico, 4,984,286, Cl. 382-54.000.

Anderson, Luis: *See—*
Stiepel, Norbert M.; Thompson, Edwin; and Anderson, Luis, 4,984,089, Cl. 358-229.000.

Ando, Hideo, to Kabushiki Kaisha Toshiba. System for applying magnetic field to opto-magnetic memory. 4,984,225, Cl. 369-13.000.

Ando, Hitoshi, to Pioneer Electronic Corporation. Satellite radio signal tracking method for GPS receivers. 4,983,980, Cl. 342-357.000.

Ando, Katsuhiko: *See—*
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.

Ando, Masakatsu: *See—*
Hirai, Hideo; Ando, Masakatsu; Hashimoto, Yasuhiro; Fujimoto, Naoki; Tanaka, Norikazu; and Yamakawa, Susumu, 4,983,145, Cl. 474-117.000.

Andoo, Keikichi: *See—*
Yasuoka, Hiroshi; Murase, Norio; Terao, Motoyasu; Nishida, Tetsuya; Andoo, Keikichi; and Ojima, Masahiro, 4,984,231, Cl. 369-275.100.

Andou, Yukinori; Yui, Yuhi; and Irihara, Kouichi, to Sharp Kabushiki Kaisha. Process cartridge having an integrally molded shield casing for the corona charger. 4,984,018, Cl. 355-200.000.

Andus, Paul G.: *See—*
Dolash, Thomas M.; Andus, Paul G.; and O'Loughlin, Mark E., 4,983,817, Cl. 235-462.000.

Angelier, Robar: *See—*
Combette, Ph.; Angelier, Robar; and Vieu, Christian, 4,983,256, Cl. 162-18.000.

Angeloz, Corinne; Huerlimann, Peter; Schmied, Rudolf; and Van Meir, Eugene, to Nestec S. A. Container and teat feeding assembly. 4,982,880, Cl. 222-490.000.

Angevine, Philip J.: *See*—
Abeil, Robert P. L.; Angevine, Philip J.; Bundens, Robert G.; and Herbst, Joseph A., 4,983,276, Cl. 208-120.000.
Anik, Shabbir: *See*—
Benjamin, Eric; Anik, Shabbir; and Lin, Ya-Yun T., 4,983,595, Cl. 514-174.000.
ANT Nachrichtentechnik GmbH: *See*—
Brunle, Siegfried; and Eberspacher, Klaus, 4,983,961, Cl. 340-825.800.
Anton/Bauer, Inc.: *See*—
Crouch, Jeffrey P., 4,984,135, Cl. 362-8.000.
Antonisdes, Harry N.; and Lynch, Samuel E., to Institute of Molecular Biology, Inc.; and President and Fellows of Harvard College. Wound healing composition of IGF-I and TGF-β. 4,983,581, Cl. 514-12.000.
Aoai, Toshiaki; Maemoto, Kazuo; and Kamiya, Akihiko, to Fuji Photo Film Co., Ltd. Photosensitive diazo resin composition with polyurethane resin having carboxyl group in its main chain. 4,983,491, Cl. 430-175.000.
Aoki, Harumi: *See*—
Tani, Nobuhiro; and Aoki, Harumi, 4,984,088, Cl. 358-228.000.
Aoki, Tomohide: *See*—
Ohasi, Tamiyosi; Mizuno, Masami; Aoki, Tomohide; and Hokari, Osamu, 4,982,757, Cl. 137-202.000.
Aoki, Tsuyoshi: *See*—
Kubota, Akihiro; Sugiura, Rikio; Aoki, Tsuyoshi; and Ono, Michio, 4,984,059, Cl. 357-68.000.
Aoki, Yoshisada: *See*—
Hibino, Hiroki; Nagayama, Yoshikatsu; Yoshikawa, Mutsumi; Takara, Toshiyuki; Goto, Masahito; Suzuki, Akira; Takehana, Sakae; Oaki, Yoshinao; Yoshimitsu, Koichi; and Aoki, Yoshisada, 4,982,725, Cl. 128-4.000.
Aono, Koji: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Aono, Koji; Doki, Ryoichi; Kuwazuru, Mamoru; Shimoda, Kouzou; and Yoshida, Tomoe, 4,983,361, Cl. 422-145.000.
Aoshima, Masashi; Shigematu, Hironobu; and Sato, Mitsuhiko, to Sumitomo Chemical Company, Limited. Methods for production of crosslinked rubber products. 4,983,685, Cl. 525-331.800.
Aoyanagi, Naoki: *See*—
Nakayama, Toshimasa; Kohara, Hidekatsu; Aoyanagi, Naoki; and Hayashi, Daisuke, 4,983,020, Cl. 350-317.000.
APF Industries: *See*—
Corrado, Pat; and Corrado, Stephen, 4,982,879, Cl. 222-400.700.
Appliance Control Technology, Inc.: *See*—
Oppor, Rick L.; and Braun, Timothy L., 4,983,811, Cl. 219-497.000.
Aprigliano, Louis F.: *See*—
Rao, A. Srinivasa; Arora, Om P.; and Aprigliano, Louis F., 4,983,571, Cl. 505-1.000.
Apsley Metals Limited: *See*—
Holroyd, Eric; Holroyd, Colin; Sumner, Anthony J. M.; and Wright, Anthony R., 4,983,239, Cl. 156-123.000.
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, to Hitachi, Ltd. Elevator apparatus. 4,982,815, Cl. 187-105.000.
Arai, Masumi: *See*—
Huzino, Seizi; Mizuki, Shinya; Arai, Masumi; and Hattori, Tadashi, 4,983,469, Cl. 428-690.000.
Arai, Takeshi: *See*—
Toyota, Sumio; and Arai, Takeshi, 4,982,888, Cl. 227-18.000.
Arai, Toshikazu: *See*—
Miyaoka, Shuuichi; Tamba, Nobuo; Arai, Toshikazu; Higuchi, Hiroshi; and Higuchi, Hisayuki, 4,984,058, Cl. 357-68.000.
Arakawa, Shuji; and Mimura, Tatsuo, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling underground excavator. 4,984,289, Cl. 405-184.000.
Arakawa, Shunsuke: *See*—
Nakajima, Shin; Yamataka, Akira; Shimizu, Hideaki; Yamauchi, Kiyotaka; and Arakawa, Shunsuke, 4,983,859, Cl. 307-419.000.
Araki, Hiroshi, to Mitsubishi Denki Kabushiki Kaisah. Control method for PWM converter. 4,984,147, Cl. 363-84.000.
Araki, Nobuhiro: *See*—
Ikegaya, Kazutoshi; Sannomiya, Kunio; Tsuda, Yukifumi; Maruyama, Yuji; Araki, Nobuhiro; and Toba, Hiroto, 4,983,827, Cl. 250-235.000.
Arao, Takashi: *See*—
Saijo, Yoshihiro; Arao, Takashi; and Yamane, Yoshitaka, 4,982,770, Cl. 141-258.000.
Arase, Makoto: *See*—
Nagai, Yoshitaka; Arase, Makoto; and Ohatake, Norio, 4,982,779, Cl. 164-152.000.
ARCH Development Corp.: *See*—
Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,982,796, Cl. 164-467.000.
Arco Chemical Technology, Inc.: *See*—
Cooper, Charles F., 4,983,329, Cl. 260-410.700.
Mascioli, Rocco L., 4,983,218, Cl. 106-600.000.
Ardaillon, Pierre; and Bourrain, Paul, to Rhone-Poulenc Sante. Granules for feeding ruminants with an enzymatically degradable coating. 4,983,403, Cl. 426-2.000.
Arima, Junichi; Hirata, Yoshihiro; Harada, Hiroshi; Furuta, Isao; Harada, Shigeru; and Tamaki, Reiji, to Mitsubishi Denki Kabushiki Kaisha. Method of forming a silicide film. 4,983,547, Cl. 437-246.000.
Aristech Chemical Corporation: *See*—
Cutter, Louis A.; Ganger, Richard A.; and Godfrey, John J., 4,983,668, Cl. 525-23.000.
Piermattie, Virginia; and Brownell, George L., 4,983,669, Cl. 525-47.000.
Arizona Board of Regents: *See*—
Capco, David G.; and Bement, William M., 4,983,527, Cl. 436-63.000.
Arlt, Dieter: *See*—
Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, 4,983,594, Cl. 514-137.000.
Armstrong World Industries, Inc.: *See*—
Balmer, Richard H.; Dees, Martin, Jr.; and Drout, Frank G., 4,983,443, Cl. 428-158.000.
Witman, Jack H., 4,983,466, Cl. 428-483.000.
Arndt, Douglas C.; and Hedgcoth, Virgle L., to Identicator Corporation. Method of making permanent images on recording surface having a thermosensitive color-developing layer thereon. 4,983,415, Cl. 427-1.000.
Arnet, Wolfgang. Drip tray. 4,982,458, Cl. 4-521.000.
Arnold, Kenneth E. Water treating using a series coalescing flume. 4,983,287, Cl. 210-259.000.
Arns, James A.: *See*—
Wreede, John E.; and Arns, James A., 4,983,003, Cl. 350-3.610.
ARO Corporation, The: *See*—
Schlachter, Leo J., 4,982,758, Cl. 137-505.420.
Arora, Om P.: *See*—
Rao, A. Srinivasa; Arora, Om P.; and Aprigliano, Louis F., 4,983,571, Cl. 505-1.000.
Arturo M. Rios: *See*—
Rios, Arturo M.; and Palermiti, Michael, 4,983,846, Cl. 250-458.100.
Arturo Salice S.p.A.: *See*—
Salice, Luciano, 4,982,476, Cl. 16-382.000.
Asahi Glass Company Ltd.: *See*—
Miyake, Haruhisa; Ito, Hiroaki; Suzuki, Koji; and Yamada, Ryoji, 4,983,264, Cl. 204-98.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,983,569, Cl. 503-217.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Suzuki, Koji, 4,983,033, Cl. 356-4.000.
Tani, Nobuhiro; and Aoki, Harumi, 4,984,088, Cl. 358-228.000.
Yoshida, Tatsuya, 4,984,023, Cl. 355-260.000.
Asai, Shin: *See*—
Makino, Kazumasa; Yoshihara, Hideo; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takeshi; Katoh, Tokunori; Morisaki, Hiroshi; Kobayashi, Masanari; and Asai, Shin, 4,984,009, Cl. 355-27.000.
Asanuma, Masato; Kaneshige, Masatoshi; and Aimoto, Toyoka, to Sharp Kabushiki Kaisha. Developing device for electrophotographic apparatus having magnet rollers. 4,982,691, Cl. 118-658.000.
Ascom Zelcom AG: *See*—
Kaufmann, Hans; Kueng, Roland; Grob, Urs; and Welti, Arnold, 4,984,247, Cl. 375-1.000.
Asea Brown Boveri Ltd.: *See*—
Eliasson, Baldur; and Kogelschatz, Ulrich, 4,983,881, Cl. 313-607.000.
Schuler, Claus; and Gerharz, Gabriele, 4,983,261, Cl. 204-30.000.
Ashland Oil, Inc.: *See*—
Carpenter, William G.; and Dunnavant, William R., 4,982,781, Cl. 164-526.000.
Ashworth Bros., Inc.: *See*—
Straight, Michael R.; and Roinestad, Gerald C., 4,982,833, Cl. 198-778.000.
Asmo Co., Ltd.: *See*—
Okazaki, Susumu; Yamamoto, Takeshi; Kajimoto, Shinshi; Konishi, Takeshi; Hisanaga, Naogi; and Tanaka, Takahiko, 4,982,993, Cl. 296-192.000.
Astra Meditec AB: *See*—
Hook, Karl-Axel; Nilson, Nils B.; and Wellenstam, Kjell I., 4,983,164, Cl. 604-87.000.
AT&T Bell Laboratories: *See*—
Brown, Reed S.; Brzezinski, Alex M.; Jue, Tinyee; Woods, William L., Jr.; and Zieles, Robert S., 4,984,268, Cl. 379-433.000.
Chan, Hinghung A.; and Oien, Michael A., 4,983,804, Cl. 219-85.110.
McIlroy, M. Douglas; and Reeds, James A., 4,984,272, Cl. 380-25.000.
Slusher, Richart E.; and Yurke, Bernard, 4,984,298, Cl. 455-619.000.
Atarashi, Junko: *See*—
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, 4,983,644, Cl. 522-14.000.
Athalye, Ravindra G., to Improved Performance Systems, Inc. Brake actuated flashing light system for a motor vehicle. 4,983,952, Cl. 340-467.000.
Atlas, Richard I., to E.J. Brooks Company. Bolt type seal with fiber optic seal. 4,982,985, Cl. 292-327.000.
Atochem North America, Inc.: *See*—
Kazmierczak, Robert T.; and Mac Leay, Ronald E., 4,983,738, Cl. 546-208.000.
Au, William G.: *See*—
Knoedler, Roy E.; Parker, Robert M.; Au, William G.; and Gebhard, Albert W., 4,982,997, Cl. 297-296.000.
Audeh, Costandi A.; Hoffman, Barry E.; and Kirker, Garry W., to Mobil Oil Corporation. Process for the production of natural gas condensate having a reduced amount of mercury from a mercury-containing natural gas wellstream. 4,983,277, Cl. 208-252.000.

Auerbach, Andrew: *See*—
Yang, Nan L.; Auerbach, Andrew; Pesce, Rose.; Broussard, Jerry A.; and Paul, James L., 4,983,708, Cl. 528-230.000.

Ausimont, S.r.l.: *See*—
Cavalli, Luigi; and Nardini, Renzo, 4,983,557, Cl. 502-26.000.
Tonelli, Claudio; and Tortelli, Vito, 4,983,780, Cl. 57-137.000.

Ausimont S.p.A.: *See*—
Zavatteri, Ignazio; and Gambini, Tiziana, 4,983,666, Cl. 524-539.000.

Avelov, Rolf I., to Danfoss A/S. Water outlet fitting with sound damper insert. 4,982,928, Cl. 251-118.000.

Avery, Donald J. Film-encapsulated-structure container for food, beverages and other consumable products and method for making of same. 4,982,872, Cl. 220-461.000.

Avila, Luis A.: *See*—
Bryker, William; and Avila, Luis A., 4,983,771, Cl. 564-304.000.

Avions Marcel Dassault-Breguet Aviation: *See*—
Dupont, Hoise; and Dupin, Gerard, 4,982,916, Cl. 244-122.0AF.

Avon Products, Inc.: *See*—
Wilmott, James M.; and Znaiden, Alexander P., 4,983,382, Cl. 424-62.000.

AVX Corporation: *See*—
Locke, Gerald M., 4,984,134, Cl. 361-529.000.

Awazu, Koichi: *See*—
Iwashita, Takashi; Awazu, Koichi; and Murase, Kiyoshi, 4,984,149, Cl. 364-200.000.

Awazu, Takao: *See*—
Tsujii, Tasuhiro; Isogai, Tatsuo; Awazu, Takao; and Kimura, Tokiya, 4,983,749, Cl. 558-88.000.

Axis S.p.A.: *See*—
Luciani, Sabatino, 4,982,908, Cl. 242-1.10R.

Aylward, J. Richard; Holl, Timothy; and Keezer, William J., to Bose Corporation. Enhancing bass. 4,984,273, Cl. 381-1.000.

Ayres, James W.; Sandine, William E.; and Parker, Richard B., to Wesman Foods, Inc.; and State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University, The, a part interest to each. Preservation of feed. 4,983,406, Cl. 426-9.000.

Ayzaguer, Juan M.: *See*—
Pulido, Miguel L.; and Ayzaguer, Juan M., 4,983,618, Cl. 514-367.000.

Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See*—
Corniani, Carlo, 4,982,554, Cl. 53-290.000.

Azumatani, Yasushi: *See*—
Satoh, Isao; Fukushima, Yoshihisa; Takagi, Yuji; and Azumatani, Yasushi, 4,984,230, Cl. 369-54.000.

B. F. Goodrich Company, The: *See*—
Backderf, Richard H., 4,983,665, Cl. 524-533.000.
Lawson, Dennis L.; and Detterman, Robert E., 4,983,687, Cl. 525-356.000.

Baba, Yoshiro: *See*—
Koshino, Yutaka; Baba, Yoshiro; Osawa, Akihiko; and Yanagiya, Satoshi, 4,984,052, Cl. 357-49.000.

Babcock & Wilcox Company, The: *See*—
Albrecht, Melvin J., 4,982,703, Cl. 122-6.00A.
Klahn, Francis C., 4,982,763, Cl. 138-89.000.

Bach, Volker: *See*—
Durr, Heinz; and Bach, Volker, 4,983,324, Cl. 252-587.000.

Backderf, Richard H., to B. F. Goodrich Company, The. Flexible blend compositions based on overpolymers of vinyl chloride polymers on ethylene copolymers. 4,983,665, Cl. 524-533.000.

Backlund, Richard A.; and Gerfast, Sten R., to Minnesota Mining and Manufacturing Company. Cleaning apparatus for magnetic data tape cartridges. 4,984,119, Cl. 360-128.000.

Badie, Paul; and Siebert, Jean-Marie, to Norsolor S.A. Process for the manufacture of petroleum resins suitable for the manufacture of printing inks, varnishes and paints. 4,983,682, Cl. 525-290.000.

Bae, Kisun; and Joo, Yunghoon, to Samsung Electronics Co., Ltd. Automatic battery exchanging system for automatic guided vehicles. 4,983,903, Cl. 320-2.000.

Bagdasarian, Samuel L., to Raytheon Company. Sprayable cork ablative protection layer. 4,983,667, Cl. 524-703.000.

Bailey, Terry R.; Tolliver, Howard R.; Degler, Douglas C.; and Chirhart, Dennis J., to Minnesota Mining and Manufacturing Company. Retroreflective sheeting with backing film. 4,983,436, Cl. 428-40.000.

Baker, Charles D.: *See*—
Peterson, Stephen C.; Brimhall, Owen D.; McLaughlin, Thomas J.; Baker, Charles D.; and Sparks, Sam L., 4,983,189, Cl. 55-15.000.

Baker, Debra; and McCardle, Mike, to Miriam Collins-Palm Beach Laboratories Co. Method of recurling tightly curled hair. 4,982,749, Cl. 132-204.000.

Baker, Francis M.: *See*—
Long, James C.; and Baker, Francis M., 4,984,249, Cl. 375-20.000.

Baker, Frank K.: *See*—
Pfiester, James R.; Baker, Frank K.; and Sivan, Richard D., 4,984,042, Cl. 357-23.900.

Baker, Kenneth M.: *See*—
Lardinois, Pierre F.; Rouxhet, Paul G.; Stone, William E. E.; Baker, Kenneth M.; and Baudichau, Alain E., 4,983,510, Cl. 435-4.000.

Baker, Wayne. Fence clip assembly. 4,982,932, Cl. 256-47.000.

Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and Le Moel, Alain, to Commissariat a l'Energie Atomique. Films having in their thickness at least two superimposed zones, including an insulating zone and a conductive zone, and the production thereof by irradiating a polymer film by means of a beam of high energy ions. 4,983,460, Cl. 428-421.000.

Balderson, Simon N., to Thorn EMI plc. Heating unit with thermochromic region. 4,983,810, Cl. 219-462.000.

Baldyrou, Armel, to Societe Generale pour l'Industrie Electronique (S.O.C.I.E.). Male contact element for low insertion force electrical connector. 4,983,134, Cl. 439-884.000.

Balint, Sandor: *See*—
Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, 4,983,764, Cl. 562-17.000.

Balint, Tibor; Drozda, Tamas; Mozes, Gyula; Kristof, Mihaly; Hanel, Eva; and Tilky, Peter, to Magyar Asvanyolaj es Foldgaz Kiserleti Intezet. Complex preparation-process for decreasing the non-radioactive salt content of waste solutions of nuclear power stations. 4,983,302, Cl. 210-638.000.

Balland, Patrick, to Labo Industrie. High-energy ignition generator especially for a gas-turbine. 4,983,886, Cl. 315-209.0CD.

Ballu, Patrick J. M., to Tecnoma. Device for projecting a treatment product onto plants. 4,982,898, Cl. 239-77.000.

Balmer, Richard H.; Dees, Martin, Jr.; and Drout, Frank G., to Armstrong World Industries, Inc. Embossed and wiped decorative surface coverings. 4,983,443, Cl. 428-158.000.

Balzers Aktiengesellschaft: *See*—
Wegmann, Urs, 4,983,269, Cl. 204-192.130.

Ban, Tomohiro: *See*—
Torii, Hiroshi; Oishi, Minoru; Ban, Tomohiro; Furukawa, Akihiro; Furushima, Tokihito; and Nakagawa, Kazuko, 4,984,162, Cl. 364-518.000.

Banfalvi, Zsofia: *See*—
Stacey, Gary; Schell, Maria G.; Nieuwkoop, Anthony J.; Deshmane, Nirupama A.; and Banfalvi, Zsofia, 4,983,519, Cl. 435-172.300.

Banjo, Toshinobu: *See*—
Uemura, Shunichi; and Banjo, Toshinobu, 4,984,062, Cl. 357-70.000.

Bannan, John A. Multi-use paint tool. 4,982,471, Cl. 15-105.000.

Banque de Frane: *See*—
Combette, Ph.; Angelier, Robar; and Vieu, Christian, 4,983,256, Cl. 162-18.000.

Baranski, Jan, to University of Western Australia, The. Proximity measurement by inductive sensing using single turn UHF energized coil sensors incorporated into cutter head of sheep shearing device. 4,983,914, Cl. 324-207.160.

Barbier, Pierre; Schneider, Fernand; and Widmer, Ulrich, to Hoffmann-La Roche Inc. Oxetanones and process for their production. 4,983,746, Cl. 549-328.000.

Barcelon, Shirley A.: *See*—
Hussein, Mamoun M.; and Barcelon, Shirley A., 4,983,394, Cl. 424-440.000.

Barder, Timothy J.; and DuBois, Philip D., to Allied-Signal Inc. Process for forming highly uniform silica spheres. 4,983,369, Cl. 423-338.000.

Barkley, Phillip G.: *See*—
Verrando, Marcel G.; White, Donald H.; Koslow, Evan E.; and Barkley, Phillip G., 4,983,190, Cl. 55-21.000.

Barmore, Thomas C. Socket wrench set. 4,982,632, Cl. 81-438.000.

Barresi, Lawrence J.; and Reilly, Charles H. L., to Wheaton Industries. In-mold labeling of injection blow molded products. 4,983,348, Cl. 264-509.000.

Barsomian, Janet M.; and Wilson, Geoffrey G., to New England Biolabs, Inc. Method for producing the HinPI restriction endonuclease and methylase. 4,983,522, Cl. 435-172.300.

Barten, Axel: *See*—
Munker, Friedrich; and Barten, Axel, 4,982,617, Cl. 74-333.000.

BASF Aktiengesellschaft: *See*—
Bobar, Georg; Schnell, Klaus; Schroeder, Gerd; and Wistuba, Eckehardt, 4,983,760, Cl. 560-190.000.
Hahn, Klaus; Guhr, Uwe; and Hintz, Hans, 4,983,639, Cl. 521-59.000.
Lawrenz, Dirk; Schupp, Hans; Schwerzel, Thomas; Oslowski, Hans-Josef; and Heimann, Ulrich, 4,983,704, Cl. 528-69.000.
Rheinheimer, Joachim; Eicken, Karl; Theobald, Hans; Kuekenhoehner, Thomas; Westphalen, Karl-Otto; Wuerzer, Bruno; Frank, Juergen; and Meyer, Norbert, 4,983,210, Cl. 71-94.000.
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Moller, Dieter; and Vorbeck, Udo, 4,983,703, Cl. 528-49.000.

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Dolash, Thomas M.; Andus, Paul G.; and O'Loughlin, Mark E., 4,983,817, Cl. 235-462.000.
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Bender-Zanoni, Joseph F.; Cook, Howard T., Jr.; Cozzy, Thomas W.; and Jarvis, Stephen A., to General Electric Company. Modular ammunition packaging and feed system. 4,982,650, Cl. 89-34.000.

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Berrebi, Georges, to Europeene de Retraitement de Catalyseurs Eurecat. Process for presulfurizing with phosphorous and/or halogen additive. 4,983,559, Cl. 502-32.000.

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Bilodeau, Raymond. Snap-together picture frame. 4,982,517, Cl. 40-155.000.

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Bisping, Bernhard; Vagedes, Michael; and Kessler, Siegfried, to Rheinmetall GmbH. Subcaliber discarding sabot projectile. 4,982,669, Cl. 102-520.000.
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Blatt, John A. Fluid operated actuator with recessed position sensor and recessed end cap fastener. 4,982,652, Cl. 92-5.00R.
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Boden, Richard M.; and McGhie, Joseph A., to International Flavors & Fragrances Inc. Cyano-substituted sulfur containing compounds, compositions containing same, processes for preparing same and organoleptic uses thereof. 4,983,579, Cl. 512-6.000.
Bodewein, Jakob, to Jagenberg Aktiengesellschaft. Device for stacking sheets, especially sheets of cardboard. 4,983,096, Cl. 414-789.500.
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Bodor, Nicholas; and Loftsson, Thorsteinn, to Key Pharmaceuticals, Inc. Percutaneous penetration enhancer of oleic acid and 2-ethyl-1,3-hexanediol. 4,983,396, Cl. 424-449.000.
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Bolt, John D.; and Subramanian, Munirpallam A., to Du Pont de Nemours, E. I., and Company. Process for making 90° K. superconductors by impregnating cellulosic article with precursor solution. 4,983,573, Cl. 505-1.000.
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Bongers, Bernd; Meurer, Rene; Oefner, Walter; Rode, Klaus; and Maier, Georg, to Messerschmitt-Bolkow-Blohm GmbH. Rail wheel. 4,982,990, Cl. 295-21.000.
Bonino, Stefano F. S.; and Cavero, Nicola B., to Pomini Farrell S.p.A.; and Italimpianti S.p.A. Reheating, holding and accumulation furnace for steelworks products. 4,982,934, Cl. 266-105.000.
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Bonko, Mark L., to Goodyear Tire & Rubber Company, The. Pneumatic tire including spaced sidewall projections. 4,982,773, Cl. 152-209.00B.
Bonner, Ben V., to A.T. & G. Company, Inc. Adaptor and driver for an adhesive capsule anchor. 4,982,625, Cl. 81-53.200.
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Boothroyd, Simon A.; Chrostowski, Jacek; and O'Sullivan, Maurice S., to National Research Council Canada. Optical phase to amplitude demodulation. 4,983,024, Cl. 350-354.000.
Borcherding, David R., to Marion Laboratories, Inc. Process for preparing 2-aromatic-3-halobenzothiazepines. 4,983,733, Cl. 540-491.000.
Borer, John W.; and Conner, Lowell J., to Libbey-Owens-Ford Co. Apparatus for bending glass sheets. 4,983,204, Cl. 65-273.000.
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Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,983,208, Cl. 71-92.000.

Braun, Dieter: *See*—
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Oppor, Rick L.; and Braun, Timothy L., 4,983,811, Cl. 219-497.000.

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Hergenrother, William L.; and Doshak, John M., 4,983,691, Cl. 525-437.000.
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Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,983,328, Cl. 260-404.500.

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Meanwell, Nicholas A., 4,983,610, Cl. 574-274.000.

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Kaye, Arthur, 4,982,918, Cl. 244-223.000.
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Rowe, David M., 4,983,225, Cl. 136-201.000.

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Dana, David E.; Lawton, Ernest L.; and Brodmann, George L., 4,983,699, Cl. 526-240.000.

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Hayakawa, Atsuya, 4,982,674, Cl. 112-121.120.
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Makino, Kazumasa; and Matsumoto, Yumio, 4,984,016, Cl. 355-72.000.
Mizuno, Toshiaki; Kimura, Shinji; Sugiura, Toshiaki; Sakuma, Mikio; Sugimoto, Tasuku; and Imaizumi, Mamoru, 4,983,854, Cl. 250-561.000.
Morii, Satoshi; Mitsui, Hiroyuki; and Iwasaki, Toshiaki, 4,982,676, Cl. 112-121.150.
Nagae, Tuyoshi, 4,983,058, Cl. 400-249.000.
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Yates, Stephen F.; Good, Mary L.; and Brubaker, Inara M., 4,983,670, Cl. 525-54.200.

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Hertzberg, Abraham; Bruckner, Adam P.; Bogdanoff, David W.; and Knowlen, Carl, 4,982,647, Cl. 89-8.000.

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Koch, Dieter; and Baum, Hans-Jakob, 4,982,616, Cl. 73-864.810.

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Boda, James C.; and Lokken, Mark T., 4,983,135, Cl. 440-88.000.

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Beck, Rene-Andre , 4,982,549, Cl. 52-726.000.

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BTS Broadcast Television Systems GmbH: *See*—
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Choe, Eui W.; Buckley, Alan; Stuetz, Dagobert E.; and Garito, Anthony F., 4,983,325, Cl. 252-600.000.

Buckman Laboratories International, Inc.: *See*—
Pulido, Miguel L.; and Ayzaguer, Juan M., 4,983,618, Cl. 514-367.000.

Budd Company, The: *See*—
Greve, Bruce N., 4,983,549, Cl. 501-27.000.

Budecker, Ludwig, to Alfred Teves GmbH. Radial piston pump. 4,983,100, Cl. 417-271.000.

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Peterson, Francis C.; and Buss, Dennis, 4,982,596, Cl. 72-467.000.

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Buisson, Dominique, to Robert Bosch GmbH. Unit fuel injector including a fuel injection pump for internal combustion engines. 4,982,713, Cl. 123-467.000.

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Caveney, Jack E.; Bulanda, John J.; and Wende, Russell E., 4,983,130, Cl. 439-407.000.

Bulat, Emel S.; and Tabasky, Marvin J., to GTE Laboratories Incorporated. Method of fabricating junction field effect transistor. 4,983,536, Cl. 437-40.000.

Bunce, Keith T.; and Humphrey, Patrick P. A., to Glaxo Group Limited. Medicaments. 4,983,621, Cl. 514-397.000.

Bundens, Robert G.: *See*—
Absil, Robert P. L.; Angevine, Philip J.; Bundens, Robert G.; and Herbst, Joseph A., 4,983,276, Cl. 208-120.000.

Bunting, William M., to Mint-Pac Technologies. Hot stamping decal resist. 4,983,246, Cl. 156-240.000.

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Buono, Dennis F.: *See*—
Hibner, David H.; Buono, Dennis F.; Dembeck, Kurt M.; and Franceschet, Roy D., 4,983,051, Cl. 384-99.000.

Burger, Heinz D., to Alcatel Hochvakuumtechnik GmbH. Method for analyzing gases according to the counter flow principle. 4,983,829, Cl. 250-282.000.

Burger, William R.; and Mandel, Barry P., to Xerox Corporation. Sorter with rocking trays. 4,982,948, Cl. 271-293.000.

Burgio, Joseph T., Jr. System and method for photochemically curing a coating on a substrate. 4,983,852, Cl. 250-504.00R.

Burnham, Benjamin K., to Gem Industries Inc. Vertically adjustable holders for the support for the mattress of a child's crib. 4,982,463, Cl. 5-11.000.

Burnham, William L.: *See*—
Meisezahl, William J.; Glogan, David J.; and Burnham, William L., 4,983,999, Cl. 354-149.110.

Burton, John W. Replaceable container for fluid dispenser. 4,982,877, Cl. 222-321.000.

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Reeder, David A.; Lopez, Carlos; and Burwick, Jack L, 4,983,354, Cl. 419-11.000.

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Busse, Ingeborg; and Mair, Eduard, to Siemens Aktiengesellschaft. Apparatus for electrical connection of insertable electrical assemblies. 4,983,126, Cl. 439-61.000.

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Vlasbloem, Hugo; and Duinker, Simon, 4,984,258, Cl. 378-145.000.

C. A. Weidmuller GmbH & Co.: *See*—
Schmode, Hartmut; Wiebe, Ulrich; and Undin, Hans, 4,982,630, Cl. 81-352.000.
Wiebe, Ulrich, 4,982,594, Cl. 72-416.000.

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Soderberg, Bo; Pettersson, Bo; Hocke, Ulf; and Naeve, Ambjorn, 4,982,504, Cl. 33-502.000.

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Claude, John P., 4,982,742, Cl. 128-798.000.

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Lee, Rosemary A.; Samarakone, Nandasiri; and Cade, Neil A., 4,983,878, Cl. 313-308.000.

Cahiez, Gerard; Laboue, Blandine; and Tozzolino, Pierre, to Societe Nationale Elf Aquitaine. Preparation of ketones by the acylation of organo-manganous compounds. 4,983,774, Cl. 568-319.000.

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Callahan, Kenneth P.; and Dines, Martin B., deceased (by Dines, Elaine, legal representative), to Occidental Research Corporation. Method of making crosslinked layered compounds. 4,983,564, Cl. 502-166.000.

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Wheadon, Ellis G.; and Forrer, Larry L., 4,982,482, Cl. 29-2.000.

Cambridge Diagnostic Products, Inc.: *See*—
Mauthner, Thomas, 4,983,375, Cl. 424-3.000.

Camco International Inc.: *See*—
Gaither, Paul I.; and Klappenbach, Steve W., 4,982,496, Cl. 29-898.042.
Pringle, Ronald E.; and Morris, Arthur J., 4,983,803, Cl. 219-69.170.

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Migeon, Henri-Noel; and Rasser, Bernard, 4,983,831, Cl. 250-309.000.

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McKenzie, Jennifer A. H., 4,983,979, Cl. 342-204.000.

Canadian Occidental Petroleum Ltd.: *See*—
Gregoli, Armand A.; Olah, Andrew M.; Hamshar, John A.; and Rimmer, Daniel P., 4,983,319, Cl. 252-314.000.

Canon Kabushiki Kaisha: *See*—
Adachi, Hideki; Tomosada, Masahiro; Suzuki, Tadashi; and Ohki, Naoyuki, 4,984,020, Cl. 355-218.000.
Fujimoto, Ryo, 4,984,102, Cl. 360-65.000.
Hirohata, Michio; Ikawa, Kazuo; and Ikuta, Kiyoshi, 4,983,998, Cl. 354-149.100.
Honda, Mitsuru; and Kubo, Takahiro, 4,982,689, Cl. 118-656.000.
Masaki, Hisaji, 4,984,284, Cl. 382-48.000.
Sugata, Masao; Masaki, Tatsuo, deceased; Komuro, Hirokazu; Hirasawa, Shinichi; and Yano, Yasuhiro, 4,983,993, Cl. 346-76.0PH.
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Yamagata, Kenji; and Ichikawa, Takeshi, 4,983,539, Cl. 437-110.000.

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Pozzi, Franco; and Carenzi, Angelo, 4,982,875, Cl. 222-83.000.

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Eckel, Hans-Gerd; and Schweikert, Willi, 4,982,937, Cl. 267-136.000.

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Weyrauch, Adolf, 4,982,502, Cl. 33-248.000.

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Carlson, Craig L.: *See*—
Orkin, Stanley S.; Carlson, Craig L.; and Rowlands, David B., 4,983,240, Cl. 156-148.000.

Carlson, Gerald J.: *See*—
Imam, Imdad; and Carlson, Gerald J., 4,984,173, Cl. 364-508.000.

Carlson, Joseph W.: *See*—
Kramer, David M.; and Carlson, Joseph W., 4,983,921, Cl. 324-309.000.

Carnell, Peter J. H.: *See*—
Denny, Patrick J.; and Carnell, Peter J. H., 4,983,365, Cl. 423-230.000.

Carney, Jayne F.: *See*—
Geiger, Jon R.; Carney, Jayne F.; and Roberts, Katherine P., 4,983,511, Cl. 435-6.000.

Caron, Richard A.: *See*—
Dubois, Robert A.; and Caron, Richard A., 4,982,867, Cl. 220-403.000.

Carpenter, Gene B. Design and construction toy. 4,983,137, Cl. 446-69.000.

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Carr, Geoffrey P. R.: *See—*
Bradley, Gerald; Carr, Geoffrey P. R.; Opalko, Albert; and Yarwood, Richard J., 4,983,617; Cl. 514-341.000.

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Hayes, Lisa; and Evans, Arthur, 4,982,586, Cl. 72-134.000.

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Carter, Joel R.: *See—*
Rondel, Stephen A.; and Carter, Joel R., 4,984,177, Cl. 364-513.500.

Carter, Marjorie H. Automatically concealed urinal. 4,982,455, Cl. 4-307.000.

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Casanova, Wayne J.; Reckinger, Arthur P., Jr.; Seyfert, Michael D.; Thorpe, James R.; and Wheeler, Stephen E., to International Business Machines Corporation. Unitized central electronics complex construction. 4,984,133, Cl. 361-415.000.

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Cashman, Donald; Ferguson, John A.; and Keyes, George B., to Drackett Company, The. Air freshener composition and device. 4,983,578, Cl. 512-3.000.

Casio Computer Co., Ltd.: *See—*
Kinoshita, Satoshi, 4,983,996, Cl. 354-76.000.
Minamitaka, Junichi, 4,982,643, Cl. 84-613.000.
Yahagi, Mitsuhisa; and Tonegawa, Nobuyuki, 4,984,274, Cl. 381-43.000.

Castner, Kenneth F.: *See—*
Kuzma, Leonard J.; and Castner, Kenneth F., 4,983,695, Cl. 526-142.000.

Caterpillar Industrial Inc.: *See—*
Ping, David T., 4,983,094, Cl. 414-621.000.

Catheter Technology Corporation: *See—*
Moorehead, Harvey R., 4,983,168, Cl. 604-161.000.

Caucik, Pavol: *See—*
Humplik, Antonin; Benckova, Maria; Caucik, Pavol; Durmis, Julius; Goghova, Marcela; Karvas, Milan; Orlik, Ivo; and Povazancova, Marta, 4,983,657, Cl. 524-120.000.

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Bonino, Stefano F. S.; and Cavero, Nicola B., 4,982,934, Cl. 266-105.000.

CBS Engineering, Inc.: *See—*
Carruba, Samuel C., 4,983,074, Cl. 405-227.000.

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Shroot, Braham; and Allec, Josiane, 4,983,625, Cl. 514-455.000.

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Jaouen, Gerard; Vessieres, Anne; and Top, Siden, 4,983,646, Cl. 552-630.000.

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CeraMem Corporation: *See—*
Goldsmith, Robert L., 4,983,423, Cl. 427-230.000.

Cerami, Anthony: *See—*
Ulrich, Peter C.; and Cerami, Anthony, 4,983,604, Cl. 514-238.500.

Ceramics Process Systems Corp.: *See—*
Pober, Richard L.; and Novich, Bruce E., 4,983,157, Cl. 494-37.000.

Cerda-Davo, Silvestre: *See—*
Schmidtmann, Burchard; and Cerda-Davo, Silvestre, 4,984,093, Cl. 358-330.000.

Cervantes, Ignacio, to Cia, Manufacturera Erc, S.A., de C.V. Adjustable ironing table cover. 4,982,516, Cl. 38-140.000.

CGE Compagnia Generale Elecltromeccanica S.p.A.: *See—*
Pardini, Franco P., 4,983,788, Cl. 200-16.00R.

Cha, Chang Y.; Duc, Michael; and Hogan, Curtis J., to Western Research Institute & ILR Services Inc. Pyrolysis methods with product oil recycling. 4,983,278, Cl. 208-407.000.

Chabala, Leonard V.: *See—*
Rogers, Edward J.; Chabala, Leonard V.; and Ramos, Joel A., 4,983,792, Cl. 200-148.00F.

Chabot, Luc G.: *See—*
Petty, Terry D.; Chabot, Luc G.; Costello, Carmon R.; and Song, Kun K., 4,983,073, Cl. 405-224.000.

Chaise, Francois. Safety helmet provided with an interlock signal. 4,982,452, Cl. 2-421.000.

Challenger Electrical Materials, Inc.: *See—*
Johnston, Earl S., 4,983,785, Cl. 174-53.000.

Chan, Anthony K.: *See—*
Kingsford, Kenji A.; and Chan, Anthony K., 4,983,104, Cl. 417-473.000.

Chan, Hinghung A.; and Oien, Michael A., to AT&T Bell Laboratories. Localized soldering by inductive heating. 4,983,804, Cl. 219-85.110.

Chandler, Roy L., to Up To Date, Inc. Retaining mechanism for eyeglasses having interchangeable lenses. 4,983,030, Cl. 351-86.000.

Chandley, George D., to Metal Casting Technology Inc. Countergravity casting method and apparatus. 4,982,777, Cl. 164-63.000.

Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, to Ricoh Company, Ltd.; and Ricoh Corporation. Laser printer controller flexible frame buffer achitecture which allows software to initiate the loading of a frame buffer start address. 4,984,182, Cl. 364-519.000.

Chang, James C.: *See—*
Naiman, Michael I.; and Chang, James C., 4,983,186, Cl. 44-394.000.

Chang, Michael N.: *See—*
Yang, Shu S.; Chiang, Yuan-Ching P.; Heck, James V.; and Chang, Michael N., 4,983,597, Cl. 514-210.000.

Chang, Yunik; Patel, Dinesh C.; and Ebert, Charles D., to TheraTech Inc. Device for administering an active agent to the skin or mucosa. 4,983,395, Cl. 424-448.000.

Charbonneau, Peter J.: *See—*
Broadhurst, Christopher M.; and Charbonneau, Peter J., 4,982,733, Cl. 128-804.000.

Charkoudian, John C.: *See—*
Etheredge, Robert W., III.; and Charkoudian, John C., 4,983,170, Cl. 604-270.000.

Charles, Kirk W.; and Slayton, Danny L., to Colorocs Corporation. Belt tensioning and quick release device for electrophotographic system. 4,983,146, Cl. 474-117.000.

Chatfield, Linda K.: *See—*
Deininger, J. Paul; and Chatfield, Linda K., 4,983,306, Cl. 210-724.000.

Chau-Huu, Tri: *See—*
Loser, Hans; Chau-Huu, Tri; and Meinecke, Albrecht, 4,982,513, Cl. 34-116.000.

Chau, Michael M.; Light, William G.; and Chu, Hong C., to Allied-Signal Inc. Dry high flux semipermeable membranes. 4,983,291, Cl. 210-490.000.

Chen, Nai Y.; Degnan, Thomas F.; and Weisz, Paul B., to Mobil Oil Corp. Shape selective crystalline silicate zeolite containing intermetallic component and use as catalyst in hydrocarbon conversions. 4,983,274, Cl. 208-111.000.

Chenpatents: *See—*
Gessner, Adolf W., 4,983,223, Cl. 134-25.400.

Cherukuri, Subraman R.; Faust, Steven M.; and Mansukhani, Gul, to Warner-Lambert Company. Reduced and low-calorie sugar and sugarless chewing gum compositions containing fiber. 4,983,405, Cl. 426-3.000.

Cherukuri, Subraman R.: *See—*
Raman, Krishna; Cherukuri, Subraman R.; Mansukhani, Gul; and Faust, Steven M., 4,983,404, Cl. 426-3.000.

Chesapeake Display and Packaging: *See—*
Church, David F.; Urbowicz, Michael B.; and Honeycut, Joseph W., 4,982,848, Cl. 211-55.000.

Cheski, Ronald A.: *See—*
Shea, John J.; Sabol, Richard P.; Paich, Louis; Cheski, Ronald A.; Sanner, Kenneth W.; and Beatty, William E., Jr., 4,983,939, Cl. 335-42.000.

Cheskis, Harvey P.: *See—*
Tungatt, Paul D.; Tyler, Derek E.; and Cheskis, Harvey P., 4,983,219, Cl. 106-287.130.

Cheung, Mo-Fung; Golovoy, Amos; and van Oene, Henk, to Ford Motor Company. Phosphate/epoxy stabilizer for extrudable polyester blends. 4,983,654, Cl. 524-100.000.

Chevron Research and Technology Company: *See—*
Tsang, Tsze H.; Spadafora, Vincent J.; and Pomidor, Patricia, 4,983,589, Cl. 514-64.000.
Tsang, Tsze H.; and Strutzel, Jon L., 4,983,590, Cl. 514-64.000.

Chiang, Yuan-Ching P.: *See—*
Yang, Shu S.; Chiang, Yuan-Ching P.; Heck, James V.; and Chang, Michael N., 4,983,597, Cl. 514-210.000.

Chiappe, Wayne T.; and Gasquoine, Randy W., to Sardee Corporation. Workload regulator for automated production. 4,983,095, Cl. 414-786.000.

Chikaraishi, Kazuo: *See—*
Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, 4,982,804, Cl. 180-140.000.

Chikuma, Isamu: *See—*
Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, 4,982,804, Cl. 180-140.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,983,207, Cl. 71-88.000.

Chirhart, Dennis J.: *See*—
Bailey, Terry R.; Tolliver, Howard R.; Degler, Douglas C.; and Chirhart, Dennis J., 4,983,436, Cl. 428-40.000.

Chisso Corporation: *See*—
Daimon, Takashi; and Sakamoto, Hideshi, 4,983,452, Cl. 428-287.000.
Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,983,751, Cl. 558-272.000.
Okamoto, Masamitsu; Wada, Masami; Funikawa, Hidenori; Kato, Haruo; and Shouji, Hideaki, 4,982,495, Cl. 29-846.000.

Cho, Wonjung; and Choi, Kwangju, to Samsung Electronics Co., Ltd. Analog style electronic watch. 4,984,223, Cl. 368-76.000.

Choay, Patrick: *See*—
Roger, Pierre; Choay, Patrick; Monneret, Claude; and Fournier, Jean-Paul, 4,983,726, Cl. 536-17.700.

Choe, Eui W.; Buckley, Alan; Stoetz, Dagobert E.; and Garito, Anthony F., to Hoechst Celanese Corp. High performance nonlinear optical media. 4,983,325, Cl. 252-600.000.

Choi, Chung G.: *See*—
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.

Choi, Jung-Dal: *See*—
Yim, Hyung-Kyu; Choi, Jung-Dal; and Lee, Woong-Moo, 4,983,860, Cl. 307-443.000.

Choi, Kwangju: *See*—
Cho, Wonjung; and Choi, Kwangju, 4,984,223, Cl. 368-76.000.

Chollet, Hugues; Maupu, Jean-Louis; and Petit, Jean-Michel, to Alsthom; and Instit National de Recherche sur les Transports et leur Securite. Vehicle with steerable axles. 4,982,671, Cl. 105-168.000.

Chopin, Thierry; Quemere, Eric; Nortier, Patrice; Schuppiser, Jean-Luc; and Segaud, Christian, to Rhone-Poulenc Chimie. Mechanically improved shaped articles. 4,983,563, Cl. 502-150.000.

Chopping, Geoffrey; and Borland, Andrew K., to Plessey Company plc. Circuit arrangement for use in the time division multiplexed signalling system. 4,984,236, Cl. 370-100.100.

Chopy, Herve , to U.S. Philips Corp. Photomultiplier tube with electrode supports. 4,983,821, Cl. 250-207.000.

Choy, Clement K.: *See*—
Mizusawa, Eugene A.; Paone, Donald J.; Casella, Tracey L.; Flores, Dorothy L.; Choy, Clement K.; Gerritsen, Jan; Heiskell, Ronald E.; Dewees, Thomas; and Ellgen, Jon L., 4,982,467, Cl. 8-158.000.

Chrostowski, Jacek: *See*—
Boothroyd, Simon A.; Chrostowski, Jacek; and O'Sullivan, Maurice S., 4,983,024, Cl. 350-354.000.

Chrysler Corporation: *See*—
Holbrook, Gerald L.; Leising, Maurice B.; Benford, Howard L.; and Mehta, Hemang S., 4,982,620, Cl. 74-731.100.
Holbrook, Gerald L., 4,982,826, Cl. 192-106.00F.
Talley, Walter D., III, 4,982,609, Cl. 73-849.000.

Chu, Benjamin; and Dhadwal, Harbans S., to Research Foundation of State University of New York, The. Light scattering and spectroscopic detector. 4,983,040, Cl. 356-338.000.

Chu, Hong C.: *See*—
Chau, Michael M.; Light, William G.; and Chu, Hong C., 4,983,291, Cl. 210-490.000.

Chujo, Yuji: *See*—
Shimizu, Joji; Chujo, Yuji; Yamamoto, Yasushi; and Noda, You, 4,982,895, Cl. 237-2.00A.

Church, David F.; Urbowicz, Michael B.; and Honeycut, Joseph W., to Chesapeake Display and Packaging. Display rack with hanger fixture. 4,982,848, Cl. 211-55.000.

Chyrsler Corporation: *See*—
Mullen, James E.; and Jurkiewicz, James S., 4,983,947, Cl. 340-426.000.

Cia, Manufacturera Erc, S.A., de C.V.: *See*—
Cervantes, Ignacio, 4,982,516, Cl. 38-140.000.

Ciba-Geigy Corporation: *See*—
Kaschig, Jurgen, 4,983,739, Cl. 546-268.000.
Mueller, Karl F.; and Harisiades, Paul, 4,983,702, Cl. 528-28.000.
Ravichandran, Ramanathan; Schirmann, Peter J.; and Mar, Andrew, 4,983,737, Cl. 546-184.000.
Ravichandran, Ramanathan; and Pastor, Stephen D., 4,983,770, Cl. 564-300.000.
Stotka, David M., 4,983,196, Cl. 65-24.000.

Civerchia, Linda, to CBS Lens,. Collagen hydrogel for promoting epithelial cell growth and artificial lens using the same. 4,983,181, Cl. 623-5.000.

Clagett, Donald C.: *See*—
Blackmon, Kenneth P.; Clagett, Donald C.; and Shafer, Sheldon J., 4,983,718, Cl. 528-336.000.

Claude, John P., to C&Y Technology, Inc. Apparatus and method to facilitate healing of soft tissue wounds. 4,982,742, Cl. 128-798.000.

Cleland, Marshall R.: *See*—
Thompson, Chester C.; Cleland, Marshall R.; and Lopez, Edward J., 4,983,849, Cl. 250-492.300.

Clextral: *See*—
Combette, Ph.; Angelier, Robar; and Vieu, Christian, 4,983,256, Cl. 162-18.000.

Cline, Harvey E.; Lorensen, William E.; and Ludke, Siegwalt, to General Electric Company. System and method for displaying oblique planar cross sections of a solid body using tri-linear interpolation to determine pixel position datae. 4,984,157, Cl. 364-413.130.

Clinical Technologies Associates, Inc.: *See*—
Steiner, Solomon S., 4,983,402, Cl. 424-491.000.

Clorox Company, The: *See*—
Mizusawa, Eugene A.; Paone, Donald J.; Casella, Tracey L.; Flores, Dorothy L.; Choy, Clement K.; Gerritsen, Jan; Heiskell, Ronald E.; Dewees, Thomas; and Ellgen, Jon L., 4,982,467, Cl. 8-158.000.

CMI Corporation: *See*—
Garbelman, David L.; and Montgomery, Raymond E., 4,982,832, Cl. 198-735.300.

Coates, Donald A.: *See*—
Adamski, Joseph R.; and Coates, Donald A., 4,982,606, Cl. 73-304.00C.

Cobb, Sanford, Jr.; and Dreyer, John F., Jr., to Minnesota Mining and Manufacturing Company. High aspect ratio light fixture and film for use therein. 4,984,144, Cl. 362-339.000.

Codex Corporation: *See*—
Keren-Zvi, Joseph; and King, Wayne M., 4,984,240, Cl. 371-8.200.

Cogan, Adrian I.: *See*—
Ditchek, Brian M.; Cogan, Adrian I.; Sichel, Enid K.; and Bloss, Walter L., III, 4,984,037, Cl. 357-22.000.

Cohen, Gordon M.; and Reich, Hans J., to Du Pont de Nemours, E. I., and Company. β-(keto or sulfonyl)esters from reaction of silylketene acetal and acyl or sulfonyl compound. 4,983,679, Cl. 525-194.000.

Cohen, James D. Fabric printing implement. 4,982,659, Cl. 101-287.000.

Cohen, Robert S.; Pierce, James M.; and Kinsey, William H., to Max-iMed Corporation. Intra-vaginal device and method for sustained drug release. 4,983,393, Cl. 424-430.000.

Cole, David J.: *See*—
Cebon, David; Cole, David J.; Hardy, Michael S. A.; and Newland, David E., 4,984,128, Cl. 361-283.000.

Colebrook, David, to Colebrook, David. Base frame structure for containers or load carrying platforms. 4,982,859, Cl. 108-51.100.

Coleman, Angus C.; and Newhart, Scott G., to Specialty Appliance Works, Inc. Method and apparatus for constructing an orthodontic appliance. 4,983,120, Cl. 433-24.000.

Colin, Yves: *See*—
Merdrignac, Odile; Guyader, Jean; Verdier, Patrick; Colin, Yves; and Laurent, Yves, 4,983,360, Cl. 422-90.000.

Colorocs Corporation: *See*—
Charles, Kirk W.; and Slayton, Danny L., 4,983,146, Cl. 474-117.000.

Colton, Ralph L. Method for producing coffee extracts. 4,983,408, Cl. 426-45.000.

Columbia Laboratories, Inc.: *See*—
Robinson, Joseph R., 4,983,392, Cl. 424-427.000.

Colvin, Howard A.: *See*—
Weinstein, Arthur H.; Colvin, Howard A.; and Parker, Dane K., 4,983,684, Cl. 525-329.100.

Combette, Ph.; Angelier, Robar; and Vieu, Christian, to Clextral; Centre Technique de l'Industries des Papiers Cartons et Cellulose; and Banque de Frane. Method for the manufacture of a paper pulp for currency use. 4,983,256, Cl. 162-18.000.

Commeyras, Auguste: *See*—
Benefice-Malouet, Sylvie; Blancou, Hubert; and Commeyras, Auguste, 4,983,776, Cl. 568-490.000.

Commissariat a l'Energie Atomique: *See*—
Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and Le Moel, Alain, 4,983,460, Cl. 428-421.000.
Boncoeur, Marcel; Lieven, Thierry; and Palacio, Marc, 4,983,339, Cl. 264-56.000.
Germain, Michel; Gillet, Bruno; and Pasquiou, Jean-Yves, 4,983,300, Cl. 210-634.000.
Ouvrier-Buffet, Jean-Louis; and Ravetto, Michel, 4,983,840, Cl. 250-352.000.

Compagnie des Cristalleries de Baccarat: *See*—
Dumas, Jean, 4,983,199, Cl. 65-60.500.

Compagnie Europeenne pour l'Equipement Menager-Cepem: *See*—
Bonnet, Jacques; and Pressouyre, Gerard, 4,983,799, Cl. 219-10.493.

Compagnie Generale des Etablissements Michelin-Michelin & Cie: *See*—
Reiniche, Andre; and Sauvage, Philippe, 4,983,227, Cl. 148-128.000.

Compaq Computer Corporation: *See*—
Abdoo, David G.; and Mayer, Dale J., 4,984,213, Cl. 365-230.300.

Computer Aided Systems, Inc.: *See*—
Lichti, Robert, Sr.; Bernard, Clay, II; Perry, Daniel C.; and Lukken, Stanley H., 4,983,091, Cl. 414-331.000.

Concord/Portex: *See*—
Hollister, William H., 4,982,842, Cl. 206-365.000.

Connan, Jean-Louis; Huiban, Jean-Yves; and Pinaud, Serge. Device for forming the hands-free function in a telephone set, associating the gain switching and echo suppression functions. 4,984,265, Cl. 379-390.000.

Conner, Lowell J.: *See*—
Borer, John W.; and Conner, Lowell J., 4,983,204, Cl. 65-273.000.

Conoco Inc.: *See*—
Scribner, Michael E., 4,982,756, Cl. 137-4.000.

Conoco Specialty Products Inc.: *See*—
Grey, Mark I., 4,983,283, Cl. 210-104.000.

Consolidated Edison Company of New York, Inc.: *See*—
Fisk, Allan T.; Freed, David I.; and Mann, Thomas A., 4,983,071, Cl. 405-154.000.

Continental Aktiengesellschaft: *See*—
Evertz, Karlheinz, 4,982,774, Cl. 152-209.00R.

Contraves Goerz Corporation: *See—*
McSparran, Lloyd W., 4,983,870, Cl. 310-90.500.
Contus, John J.: *See—*
Davis, Orin H.; and Contus, John J., 4,982,585, Cl. 70-269.000.
Cook, Howard T., Jr.: *See—*
Bender-Zanoni, Joseph F.; Cook, Howard T., Jr.; Cozzy, Thomas W.; and Jarvis, Stephen A., 4,982,650, Cl. 89-34.000.
Cook, Lee M.: *See—*
Feller, W. Bruce; and Cook, Lee M., 4,983,551, Cl. 501-74.000.
Cooper, Charles F., to Arco Chemical Technology, Inc. Preparation of esterified propoxylated glycerin from free fatty acids. 4,983,329, Cl. 260-410.700.
Cooper, Erwin E.; Davis, Franklin L.; and Sagan, Stephen F., to Texas Instruments Incorporated. Forward looking infrared imaging system. 4,983,837, Cl. 250-334.000.
Cooper Industries, Inc.: *See—*
King, Christopher R., 4,982,795, Cl. 166-382.000.
Coors Porcelain Company: *See—*
Roy, Donald W.; and Hastert, James L., 4,983,555, Cl. 501-120.000.
Copal Company Limited: *See—*
Matsumoto, Jun-ichi; Sasaki, Toyonori; and Touma, Kiyoshi, 4,984,003, Cl. 354-235.100.
Copperthwaite, Richard G.; Themistocleous, Themistoclis; and Hutchings, Graham J., to Pratley Investments (Proprietary) Limited. Modified zeolite catalysts. 4,983,560, Cl. 502-85.000.
Copps, Freddie C. Game bird wetting apparatus. 4,982,702, Cl. 119-158.000.
Corby, Michael P. Treatment of mastitis and applicator therefor. 4,983,634, Cl. 514-622.000.
Cordt, Hartmut: *See—*
Muller, Armin; and Cordt, Hartmut, 4,984,165, Cl. 364-426.020.
Coriolis Corporation: *See—*
Iversen, Arthur H., 4,984,066, Cl. 357-82.000.
Corniani, Carlo, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Apparatus for applying closures to containers. 4,982,554, Cl. 53-290.000.
Corning Incorporated: *See—*
Nolan, Daniel E.; and Williams, Gregory E., 4,983,195, Cl. 65-4.200.
Corrado, Pat; and Corrado, Stephen, to APF Industries. Bottle contents dispensing and contents preservation apparatus. 4,982,879, Cl. 222-400.700.
Corrado, Stephen: *See—*
Corrado, Pat; and Corrado, Stephen, 4,982,879, Cl. 222-400.700.
Correpro (Canada) Inc.: *See—*
Millen, Ted I., 4,984,292, Cl. 455-40.000.
Cosentino, Stephen J., to Motorola, Inc. Method of fabricating a single polysilicon bipolar transistor which is compatible with a method of fabricating CMOS transistors. 4,983,531, Cl. 437-31.000.
Costales, Mark J.: *See—*
Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.
Costello, Carmon R.: *See—*
Petty, Terry D.; Chabot, Luc G.; Costello, Carmon R.; and Song, Kun K., 4,983,073, Cl. 405-224.000.
Cox, Michael F.; Schwab, Peter A.; and Smith, Dewey L., to Vista Chemical Company. Surfactant compositions. 4,983,323, Cl. 252-551.000.
Cozzy, Thomas W.: *See—*
Bender-Zanoni, Joseph F.; Cook, Howard T., Jr.; Cozzy, Thomas W.; and Jarvis, Stephen A., 4,982,650, Cl. 89-34.000.
Crandall, Craig E.: *See—*
Maiette, Ralph L.; Starre, Stephen T.; Thomas, Dayton C.; and Crandall, Craig E., 4,983,809, Cl. 392-407.000.
Crass, Guenther; Janocha, Siegfried; and Bothe, Lothar, to Hoechst Aktiengesellschaft. Biaxially oriented opaque polyolefin multi-layer film. 4,983,447, Cl. 428-216.000.
Cravador, Alfredo: *See—*
Herzog, Albert; Cravador, Alfredo; Houard, Sophie; and Bollen, Alex, 4,983,728, Cl. 536-27.000.
Creanova AG, Firma: *See—*
Krawagna, Louis A., 4,982,866, Cl. 220-335.000.
Cremona, Lorenzo: *See—*
Luminari, Massimo, 4,984,172, Cl. 364-478.000.
Creuzet, Gerard; and Friederich, Alain, to Thomson-CSF. Method for forming a thin layer of superconducting material on a substrate and article produced thereby. 4,983,570, Cl. 505-001.000.
Crinquette, Jean-Marie: *See—*
Wright, Dan; Riach, Allan; Crinquette, Jean-Marie; Sibuet, Rene ; and Long, Jacques, 4,983,106, Cl. 418-2.000.
Crissinger, Dean R.: *See—*
Noreen, Allen L.; Crissinger, Dean R.; Melbye, William L.; Rodgers, Eric G.; Sipinen, Alan J.; and Wood, Leigh F., 4,983,174, Cl. 604-389.000.
Cross, Kathryn: *See—*
Wieserman, Larry F.; Wefers, Karl; Cross, Kathryn; and Martin, Edward S., 4,983,566, Cl. 502-401.000.
Crossley, Peter W.: *See—*
Worrall, Peter W.; and Crossley, Peter W., 4,983,812, Cl. 219-451.000.
Crouch, Jeffrey P., to Anton/Bauer, Inc. Interchangeable camera light mount. 4,984,135, Cl. 362-8.000.
Crow, Lee. Spray wand. 4,982,896, Cl. 239-11.000.
Crowley, Richard N., to Intel Corporation. Driven guard probe card. 4,983,907, Cl. 324-158.00P.
Crum, Stephen M.: *See—*
Iwaskow, Richard S.; and Crum, Stephen M., 4,983,456, Cl. 428-254.000.
CSA Inc.: *See—*
Stevens, Mark T., 4,982,839, Cl. 206-215.000.
CTB, Inc.: *See—*
Momont, Timothy W., 4,982,699, Cl. 119-72.500.
Cucheran, John S., to Bott, John A. Article carrier. 4,982,886, Cl. 224-321.000.
Culver, Craig F. Multifunction tactile manipulatable control. 4,982,618, Cl. 74-471.0XY.
Cummings, Kathleen M.; and Hanson, Russell W., to Rockwell International Corporation. Multi-channel microwave receiver having self-test capability. 4,984,293, Cl. 455-133.000.
Cunningham, Robert A., Jr., to Glass Master Corporation. Apparatus and method for forming shiplap duct. 4,983,081, Cl. 83-39.000.
Curliss, Danny R.; and Looney, Dwight E., to Mt. Vernon Plastics Corporation. Method for molding a one-piece molded end closure. 4,983,346, Cl. 264-328.100.
Curtice-Burns, Inc.: *See—*
Meyer, Richard S.; and Duersch, James W., 4,983,413, Cl. 426-589.000.
Cushman, Robert; Kirsch, Wolff M.; and Zhu, Yong H., to University of New Mexico. Deformable plastic surgical clip. 4,983,176, Cl. 606-151.000.
Cutter, Louis A.; Ganger, Richard A.; and Godfrey, John J., to Aristech Chemical Corporation. Polymer partculates for molding and the like. 4,983,668, Cl. 525-23.000.
Daar, Yair; and Yahav, Shimon. Depilatory device. 4,983,175, Cl. 606-133.000.
Dadson, Joseph E.; and Agarwal, Mahesh. Method for using a connector cap and cover therefor. 4,983,161, Cl. 604-28.000.
DAF Special Products: *See—*
Luijten, Waltherus J. T. H., 4,983,153, Cl. 475-343.000.
Daihachi Chemical Industry Co., Ltd.: *See—*
Yamanaka, Hiroshi; and Nakamura, Yasuhiro, 4,983,231, Cl. 148-301.000.
Daiichi Seiyaku Co., Ltd.: *See—*
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, 4,983,725, Cl. 536-4.100.
Daikin Industries, Ltd.: *See—*
Tamura, Koji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 4,983,312, Cl. 252-67.000.
Daimler-Benz AG: *See—*
Holzhauer, Horst; Loffler, Eberhard; and Kneib, Rudi, 4,984,269, Cl. 379-454.000.
Muller, Armin; and Cordt, Hartmut, 4,984,165, Cl. 364-426.020.
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Nolke, Gunter; Ketterer, Gunter; and Dyma, Horst, 4,984,117, Cl. 360-124.000.

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Atlas, Richard I., 4,982,985, Cl. 292-327.000.

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Franke, Ernest A., 4,983,988, Cl. 343-853.000.

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Earnest, William D., Jr. Hand-held traffic signaling device. 4,982,683, Cl. 116-63.00P.

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Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 4,983,553, Cl. 501-96.000.

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Bertram, Gary B.; and McGlen, James A., 4,982,771, Cl. 141-312.000.
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Sublett, Bobby J.; and Beavers, Randy S., 4,983,711, Cl. 528-272.000.
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Bogda, Richard C.; and Georgacakis, George D., 4,983,790, Cl. 200-30.00R.
Preston, David M.; Walton, Erlen B.; Oliver, James L.; and Juriga, James A., 4,982,972, Cl. 280-121.000.

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Sasaki, Toshio; Sogabe, Eiji; and Ebara, Takeshi, 4,983,561, Cl. 502-107.000.

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Ishikawa, Jiro; Higuchi, Hirofumi; Ebata, Shuji; and Kida, Koichi, 4,983,757, Cl. 560-103.000.

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Brunle, Siegfried; and Eberspacher, Klaus, 4,983,961, Cl. 340-825.800.

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Chang, Yunik; Patel, Dinesh C.; and Ebert, Charles D., 4,983,395, Cl. 424-448.000.

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Fourrey, Francois; Deley, Serge; and Escaravage, Gerard, 4,982,981, Cl. 280-801.000.

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Becker, Karin; Braun, Dieter; and Edel, Gerd, 4,983,066, Cl. 403-274.000.

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Steer, Peter L.; and Edwards, John V., 4,983,172, Cl. 604-332.000.

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Green, Alan C.; and Eeles, Richard, 4,982,734, Cl. 128-200.140.

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Hasegawa, Kenji; Nakashima, Nakashima; Eguchi, Toru; and Masako, Ota, 4,983,385, Cl. 424-78.000.

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Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.

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Eichenlaub, Dennis P.: *See*—
Proctor, Robert H.; and Eichenlaub, Dennis P., 4,982,576, Cl. 62-292.000.

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Eickmann, Karl. Aircraft with a plurality of propellers, a pipe structure for thereon holdable wings, for vertical take off and landing. 4,982,914, Cl. 244-56.000.

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Stumpp, Michael; Neumann, Peter; and Eilingsfeld, Heinz, 4,983,773, Cl. 568-034.000.

Eisenstadt, Amihai, to Bromine Compounds Ltd. Method for the manufacture of dimethyl, octyl - or pentyl - para-aminobenzoic acid. 4,983,754, Cl. 560-19.000.

Ekiner, Okan M.; and Hayes, Richard A., to Du Pont de Nemours, E. I., and Company; and L'Air Liquide S.A. Production of aromatic polyimide membranes. 4,983,191, Cl. 55-158.000.

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Bregeault, Jean-Marie; El-Ali, Bassam; and Martin, Jacques, 4,983,767, Cl. 562-528.000.

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Van de Pas, Leo, 4,983,964, Cl. 340-870.310.

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Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; Sturzebecher, Claus-Steffen; and Elger, Walter, 4,983,629, Cl. 514-530.000.

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Blaszczak, Larry C.; Munroe, John E.; and Spry, Douglas O., 4,983,732, Cl. 540-360.000.
Flaugh, Michael E., 4,983,622, Cl. 514-411.000.
Hertel, Larry W.; and Reamer, Marie T., 4,983,724, Cl. 536-4.100.

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Cavero, Icilio; Elkik, Francois; Hicks, Peter; and Muller, Jean-Claude, 4,983,598, Cl. 514-211.000.

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Mizusawa, Eugene A.; Paone, Donald J.; Casella, Tracey L.; Flores, Dorothy L.; Choy, Clement K.; Gerritsen, Jan; Heiskell, Ronald E.; Dewees, Thomas; and Ellgen, Jon L., 4,982,467, Cl. 8-158.000.

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EMF Corporation: *See*—
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Emori, Takahisa, to Tatsu Corporation Co., Ltd. High defination video signal recording system. 4,984,094, Cl. 358-335.000.

Emyville Enterprises Limited: *See*—
Kidney, Paul D.; Rowlands, Andrew S.; and Mills, William P., 4,984,279, Cl. 382-1.000.

Endo, Katsuhiko: *See*—
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Endo, Tsunehiro: *See—*
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Endoh, Yuzo: *See—*
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Enomoto, Masayuki: *See—*
Kimura, Shizuo; Watano, Yukihisa; Yamashita, Sachihiro; and Enomoto, Masayuki, 4,982,891, Cl. 228-47.000.

Entenmann, Gunther: *See—*
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Eolas: *See—*
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Epilogics, Inc.: *See—*
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Eppendorf-Netheler-Hinz GmbH: *See—*
Gora, Heinz-Jurgen, 4,982,614, Cl. 73-863.810.

Epron Industries Limited: *See—*
Griffin, Gerald J. L., 4,983,651, Cl. 524-47.000.

Erb, Roger; Johnson, Robert; and Smith, Richard, to American National Can Company. Cooling device for glass container forming machine. 4,983,203, Cl. 65-265.000.

Ercolani, Dario : *See—*
Lagana, Vincenzo; Ercolani, Dario ; and Donati, Elio, 4,983,187, Cl. 44-280.000.

Erickson, Todd: *See—*
Prascak, Brian; and Erickson, Todd, 4,982,845, Cl. 206-621.000.

Eriksson, Jan E., to Powerscreen International Limited. Screening apparatus. 4,983,280, Cl. 209-241.000.

Ernst, James J.; Williamson, Steven; Rogers, George; and Musto, Dominick J., to Symtron Systems, Inc. Fire fighting trainer. 4,983,124, Cl. 434-226.000.

Ersek, Tibor: *See—*
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,983,207, Cl. 71-88.000.

Escaravage, Gerard: *See—*
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Eskofot A/S: *See—*
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Esteban, Bernardo L.; and Hernandez, Efrain B., to Woods Wire Products, Inc. Pre-molded electrical plug body. 4,983,131, Cl. 439-456.000.

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Saltel, Claude; and Petit, Daniel, 4,982,454, Cl. 4-300.000.

Etheredge, Robert W., III.; and Charkoudian, John C., to Kendall Company, The. Nasogastric device. 4,983,170, Cl. 604-270.000.

Eto, Yoshizumi: *See—*
Doi, Nobukazu; Izumita, Morishi; Mita, Seiichi; and Eto, Yoshizumi, 4,983,965, Cl. 341-72.000.

Eun, Jin-Pyo, to SamSung Electronics Co., Ltd. Break-in method in a key system. 4,984,263, Cl. 379-158.000.

Europeene de Retraitement de Catalyseurs Eurecat: *See—*
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Evans, Arthur: *See—*
Hayes, Lisa; and Evans, Arthur, 4,982,588, Cl. 72-134.000.

Evans, Donald: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,983,431, Cl. 428-34.200.

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Evertz, Karlheinz, to Continental Aktiengesellschaft. Tread profile for a pneumatic vehicle tire. 4,982,774, Cl. 152-209.00R.

Exabyte Corporation: *See—*
Herger, Zoltan L.; and Nejezchleb, Vladimir, 4,984,106, Cl. 360-92.000.

Exchange System, The: *See—*
LaBounty, Jack, 4,984,270, Cl. 380-24.000.

Exibelco GmbH: *See—*
Spath, Werner F., 4,983,065, Cl. 403-252.000.

Exim Design Handelsgesellschaft mbH: *See—*
Guenther, Gerhard, 4,982,518, Cl. 40-371.000.

Exxon Chemical Patents Inc.: *See—*
Robinson, Peter M.; and Van-Det, Nguyen, 4,983,698, Cl. 526-207.000.

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Agarwal, Pawan K., 4,983,652, Cl. 524-66.000.
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Ezawa, Hiroshi: *See—*
Yoshida, Masatsugu; Maruyama, Seishiro; Ezawa, Hiroshi; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,983,238, Cl. 156-86.000.

Fadda, Fabio: *See—*
Gessa, Gian Luigi; Fadda, Fabio; and Mormile di Campochiaro, Chiara, 4,983,632, Cl. 514-557.000.

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Fanuc, Ltd.: *See—*
Karube, Norio, 4,984,245, Cl. 372-59.000.
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,984,175, Cl. 364-513.000.

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Faude, Jack H.: *See—*
Maldonado, Robert; and Faude, Jack H., 4,984,261, Cl. 378-202.000.

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Cherukuri, Subraman R.; Faust, Steven M.; and Mansukhani, Gul, 4,983,405, Cl. 426-3.000.
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Fedorov, Svyatoslav N.; Linnik, Leonid F.; Sukhareva, Natalya I.; and Korotkov, Igor I. Device for fixing a donor's eyeball. 4,982,969, Cl. 279-1.00R.

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Feldman, Paul H., to Hazeltine Corporation. Active array element amplitude stabilization. 4,983,981, Cl. 342-372.000.

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Hopkins, Jeffrey A.; McGuinness, Roger M.; Agrawal, Rakesh; and Feldman, Steven L., 4,983,194, Cl. 62-22.000.

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Feller, W. Bruce; and Cook, Lee M., to Galileo Electro-Optics Corp. Channel electron multipliers. 4,983,551, Cl. 501-74.000.

Ferag AG: *See—*
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Frohlich, Beat, 4,983,990, Cl. 346-1.100.

Fergason, James L. Modulated retroreflector system. 4,983,021, Cl. 350-332.000.

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Ho, Keese; Ferguson, Bruce R.; and Sandoval, Gregory J., 4,984,079, Cl. 358-160.000.

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Ferro Corporation: *See—*
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Fidlin, Paul F.: *See—*
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Finegold, Hyman B.: *See—*
Seitz, David R.; Finegold, Hyman B.; and Heaton, Mark T., 4,982,827, Cl. 198-341.000.

Finke, Harry P.: *See—*
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Finkelstein, Harvey, to Tri-Seal International, Inc. Backing for flexible materials on cap brims or the like. 4,982,449, Cl. 2-192.000.

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Broadhurst, Christopher M.; and Charbonneau, Peter J., 4,982,733, Cl. 128-804.000.
Fiorese, Francesco. Apparatus for repairing damaged vehicles. 4,982,595, Cl. 72-447.000.
First Pacific Networks: *See*—
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Fischer, Wolfgang: *See*—
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Fisk, Allan T.; Freed, David I.; and Mann, Thomas A., to Consolidated Edison Company of New York, Inc. Pipe bursting and replacement apparatus and method. 4,983,071, Cl. 405-154.000.
Fitjer, Holger, to Georg Karl geka-brush GmbH. Disposable mascara tester. 4,982,838, Cl. 206-209.000.
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Ramani, Rajendrakumar N., 4,982,500, Cl. 30-254.000.
Flaugh, Michael E., to Eli Lilly and Company. 6-substituted-4-dialkylaminotetrahydrobenz(c,d)indoles. 4,983,622, Cl. 514-411.000.
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Flotec, Inc.: *See*—
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Floyd, Middleton B., Jr. Precursors and synthesis of di-(methyl)-16,16-(dimethyl)-11-alpha,15-alpha beta-dihydroxy-9-oxo-2,13-trans,trans-prostadienoates. 4,983,753, Cl. 560-17.000.
Flum, Paul L.; and Fowler, Dewalt W., to Paul Flum Ideas, Inc. Adapter means for converting a horizontally arranged shelf member in a modular display unit to an angular orientation. 4,982,849, Cl. 211-59.200.
Flunkert, Horst W.: *See*—
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Flynn, Jeffrey C., to Ultrasystems Defense Inc. Programmable state machines connectable in a reconfiguration switching network for performing real-time data processing. 4,984,192, Cl. 364-900.000.
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Fohl, Timothy: *See*—
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Folkins, Jeffrey J., to Xerox Corporation. Electrode wire cleaning. 4,984,019, Cl. 355-215.000.
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Cheung, Mo-Fung; Golovoy, Amos; and van Oene, Henk, 4,983,654, Cl. 524-100.000.
Rhodes, Eugene E., 4,982,784, Cl. 165-109.100.
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Gaylord, Norman G.; and Nigalaye, Ashok, 4,983,398, Cl. 424-465.000.
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Wheadon, Ellis G.; and Forrer, Larry L., 4,982,482, Cl. 29-2.000.
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Mikawa, Ryozo, 4,982,998, Cl. 301-11.00R.
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Rudell, Elliot; and Foster, George, 4,982,959, Cl. 273-1.0GE.
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Rajaram, Babu; and Foster, Mark J., 4,984,209, Cl. 365-222.000.
Foster, Paul M. Supplemental fuel vapor system. 4,982,715, Cl. 123-518.000.
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Winans, Luther, Jr.; and Foster, Terry L., 4,983,163, Cl. 604-49.000.
Foulke, Richard F.; and Lord, Steven M., to Proconics International, Inc. Wafer transfer apparatus. 4,983,093, Cl. 414-416.000.
Foulletier, Louis: *See*—
Bertocchio, Rene; Foulletier, Louis; and Lantz, Andre, 4,983,769, Cl. 564-96.000.
Fournier, Donald J.; and Jacobs-Perkins, Douglas W., to Survival Technology, Inc. Package. 4,982,769, Cl. 141-98.000.
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Roger, Pierre; Choay, Patrick; Monneret, Claude; and Fournier, Jean-Paul, 4,983,726, Cl. 536-17.700.
Fourrey, Francois; Deley, Serge; and Escaravage, Gerard, to Ecia-Equipements et Composants pour l'Industrie Automobile. Mechanism for seat belt with a manually adjustable position. 4,982,981, Cl. 280-801.000.
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Bidwell, Christopher C.; and Fowler, Dewalt W., 4,982,840, Cl. 206-223.000.
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Griffaton, Jacques, 4,983,796, Cl. 219-121.630.
Franaszek, Peter A., to International Business Machines Corporation. Multistage network with distributed pipelined control. 4,984,237, Cl. 370-60.000.
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Hibner, David H.; Buono, Dennis F.; Dembeck, Kurt M.; and Franceschet, Roy D., 4,983,051, Cl. 384-99.000.
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Weimann, Klaus, 4,982,667, Cl. 102-476.000.
Frank, Juergen: *See*—
Rheinheimer, Joachim; Eicken, Karl; Theobald, Hans; Kuekenhoehner, Thomas; Westphalen, Karl-Otto; Wuerzer, Bruno; Frank, Juergen; and Meyer, Norbert, 4,983,210, Cl. 71-94.000.
Frank, Kurt: *See*—
Stiefel, Hans-Peter; and Frank, Kurt, 4,982,602, Cl. 73-118.200.
Franke, Ernest A., to E-Systems, Inc. Antenna with enhanced gain. 4,983,988, Cl. 343-853.000.
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Turner, Anthony P. F.; Hodges, Alan P.; Franklin, Ann; Ramsay, Graham; and Steel, Davina, 4,983,516, Cl. 435-34.000.
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Karlsson, Karl O.; Westerlund, Alf T.; and Fransson, Gunnar S., 4,983,129, Cl. 439-395.000.
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Pitzer, Ulrike; Laubach, Benno; and Franz, Gerhard, 4,983,371, Cl. 423-344.000.
Franz, Helmut; and Goodwin, George B., to PPG Industries, Inc. Chemically reacted glass surface. 4,983,459, Cl. 428-410.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; Hansmann, Johann, deceased; Oellerer, Friedrich; and Gruber, Leopold R., 4,983,801, Cl. 219-54.000.
Frass, Werner: *See*—
Rode, Klaus; Mohr, Dieter; and Frass, Werner, 4,983,498, Cl. 430-284.000.
Frazier-Simplex, Inc.: *See*—
Trunzo, Angelo J., 4,983,206, Cl. 65-335.000.
Frederick, Carl R., to Frederick Research Corp. Method and apparatus for impeding the spillage of a liquid cargo from a damaged water-traveling vessel. 4,982,678, Cl. 114-74.00R.
Frederick Research Corp.: *See*—
Frederick, Carl R., 4,982,678, Cl. 114-74.00R.
Freed, Brian S.: *See*—
Effland, Richard C.; Klein, Joseph T.; Olsen, Gordon E.; Davis, Larry; Hamer, Russell R. L.; and Freed, Brian S., 4,983,615, Cl. 514-337.000.
Freed, David I.: *See*—
Fisk, Allan T.; Freed, David I.; and Mann, Thomas A., 4,983,071, Cl. 405-154.000.
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Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., to Merck Frosst Canada, Inc. Leukotriene antagonists. 4,983,628, Cl. 514-510.000.
Frie, Monika: *See*—
Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,983,208, Cl. 71-92.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
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Creuzet, Gerard; and Friederich, Alain, 4,983,570, Cl. 505-001.000.
Friedman, Herbert, to Ivy Hill Corporation. Sift-proof carton and blank therefor. 4,982,846, Cl. 206-621.300.
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Wanner, Hans, 4,982,923, Cl. 248-286.000.
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Korner, Klaus; and Fritz, Holger, 4,983,042, Cl. 356-359.000.
Fritzsche, Peter: *See*—
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Kozak, William G.; and Frizzell, Felicia E., 4,983,068, Cl. 405-36.000.

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Frost, Jonathan: *See*—
Manoury, Philippe; Obitz, Daniel; Peynot, Michel; and Frost, Jonathan, 4,983,607, Cl. 514-253.000.

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Frystak, Richard; and O'Callaghan, John S., Sr., to Bell & Howell Company. Film number writing system. 4,984,008, Cl. 355-24.000.

Fuchigami, Mitsuru: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,983,569, Cl. 503-217.000.

Fuchs, Leonhard; and Fuchs, Martin. Process for the disinfection and aerobic stabilization of sewage sludge. 4,983,298, Cl. 210-613.000.

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Fuji Electric Co., Ltd.: *See*—
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Fuji Jukogyo Kabushiki Kaisha: *See*—
Abe, Kunihiro, 4,982,712, Cl. 123-424.000.
Sekiguchi, Akihiko, 4,982,994, Cl. 296-195.000.
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Fuji Photo Film Co., Ltd.: *See*—
Aoai, Toshiaki; Maemoto, Kazuo; and Kamiya, Akihiko, 4,983,491, Cl. 430-175.000.
Higuchi, Manabu; Yabe, Masao; Matsubara, Hideki; and Jitsumatsu, Tetsuji, 4,983,505, Cl. 430-495.000.
Inoue, Nobuaki; and Yoshida, Tetsuo, 4,983,509, Cl. 430-627.000.
Ishiguro, Shoji; and Morimoto, Kiyoshi, 4,983,508, Cl. 430-569.000.
Kato, Eiichi; and Ishii, Kazuo, 4,983,486, Cl. 430-115.000.
Kiso, Takeshi; and Masuda, Takanori, 4,982,600, Cl. 73-104.000.
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Mochizuki, Kouichi; Nakahara, Hiromi; and Yasunaga, Tadashi, 4,983,421, Cl. 427-130.000.
Nagashima, Yasuo, 4,984,121, Cl. 360-130.340.
Nakamine, Takeshi; Ono, Michio; and Kubodera, Seiiti, 4,983,493, Cl. 430-201.000.
Nakamura, Hiroshi, 4,984,010, Cl. 355-27.000.
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Saito, Hitoshi, 4,983,439, Cl. 428-64.000.
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,084, Cl. 398-209.000.
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,090, Cl. 358-229.000.
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Takahashi, Osamu; Naruse, Hideaki; Morigaki, Masakazu; Ohki, Nobutaka; and Furutachi, Nobuo, 4,983,507, Cl. 430-551.000.
Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, 4,982,687, Cl. 118-410.000.
Takayanagi, Takashi; and Kawaguchi, Hideo, 4,983,429, Cl. 428-001.000.
Takeo, Hideya, 4,983,835, Cl. 250-327.200.
Terashita, Takaaki, 4,984,013, Cl. 355-38.000.
Umemura, Shizuo, 4,983,025, Cl. 350-377.000.
Yamada, Makoto; and Matsushita, Tetsunori, 4,983,489, Cl. 430-138.000.
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Yoda, Akira; Sato, Yoshimitu; and Ozaki, Takao, 4,984,004, Cl. 354-317.000.

Fuji Xerox Co., Ltd.: *See*—
Kato, Nobuhisa; and Moriguchi, Fujio, 4,984,092, Cl. 358-298.000.

Fujihara, Susumu: *See*—
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Fujii, Akio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,983,328, Cl. 260-404.500.

Fujii, Atsuhiro: *See*—
Okumura, Yoshinori; Fujii, Atsuhiro; Nagatomo, Masao; Ozaki, Hiroji; Wakamiya, Wataru; and Matsukawa, Takayuki, 4,984,055, Cl. 357-54.000.

Fujii, Kousuke: *See*—
Takayama, Norikazu; Ushijima, Nobuyoshi; Kobashi, Tetsuzo; Sato, Masahiko; Yano, Yoshihiko; Isozaki, Jun; Fujii, Kousuke; and Kudoh, Yoshinobu, 4,984,100, Cl. 360-49.000.

Fujii, Setsuro, to Otsuka Pharmaceutical. 5-fluorouracil derivatives. 4,983,609, Cl. 514-274.000.

Fujii, Yasuhiro: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Oosumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.

Fujikawa, Shigeaki; Koga, Kunimasa; and Yokota, Tomoko, to Suntory Limited. Method of immobilizing enzymes on a support with iridoid a glycone cross-linking agents. 4,983,524, Cl. 435-174.000.

Fujikawa, Takao: *See*—
Uehara, Katsuhiro; Ishii, Takahiko; Fujikawa, Takao; Kanda, Kuniaki; and Narukawa, Yutaka, 4,983,112, Cl. 425-136.000.

Fujimoto, Akira: *See*—
Yokota, Chitoshi; Kawano, Minoru; Sueyoshi, Masahiko; Nishida, Toshiro; Setoguchi, Shohachi; and Fujimoto, Akira, 4,982,984, Cl. 292-201.000.

Fujimoto, Hideki, to Pioneer Electronic Corporation. Frequency response detection apparatus. 4,983,919, Cl. 324-77.00E.

Fujimoto, Hiromu; Yanagawa, Nobuhide; and Harada, Eriya, to Kubota Ltd. Tractor equipped with working implements. 4,982,799, Cl. 172-2.000.

Fujimoto, Hitoshi; and Tsumura, Kiyoaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,984,056, Cl. 357-67.000.

Fujimoto, Hitoshi: *See*—
Masuda, Hisao; Fujimoto, Hitoshi; and Osaka, Shuichi, 4,982,728, Cl. 228-4.500.

Fujimoto, Naoki: *See*—
Hirai, Hideo; Ando, Masakatsu; Hashimoto, Yasuhiro; Fujimoto, Naoki; Tanaka, Norikazu; and Yamakawa, Susumu, 4,983,145, Cl. 474-117.000.

Fujimoto, Ryo, to Canon Kabushiki Kaisha. Information signal recording apparatus and apparatus for reproducing the same. 4,984,102, Cl. 360-65.000.

Fujimura, Itaru: *See*—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu; Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, 4,982,979, Cl. 280-707.000.

Fujimura, Katsunori; Saitoh, Hiroshi; and Matsumoto, Michio, to Matsushita Electric Industrial Co., Ltd. Microphone apparatus for a video camera. 4,984,087, Cl. 358-225.000.

Fujimura, Shuzo; Shinagawa, Keisuke; and Hikazutani, Kenichi, to Fujitsu Limited. Processing for stripping organic material. 4,983,254, Cl. 156-643.000.

Fujino, Akio: *See*—
Saito, Yoshiomi; Fujino, Akio; and Ikeda, Atsumi, 4,983,678, Cl. 525-193.000.

Fujioka, Yoshihide; Harada, Shigeyuki; Ohba, Toshihiro; Kanatani, Yoshiharu; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Thin film EL display panel drive circuit. 4,983,885, Cl. 315-169.300.

Fujisaka, Hisato: *See*—
Ogata, Akimitsu; Fujisaka, Hisato; Igarashi, Sadao; Nozu, Toshimitsu; Onozato, Katsura; Hirose, Masanobu; and Miwa, Katsuji, 4,983,976, Cl. 342-42.000.

Fujisawa Pharmaceutical Company, Ltd.: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,983,596, Cl. 514-210.000.

Fujitsu America, Inc.: *See*—
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Fujitsu Limited: *See*—
Fujimura, Shuzo; Shinagawa, Keisuke; and Hikazutani, Kenichi, 4,983,254, Cl. 156-643.000.
Gotou, Hiroshi, 4,983,538, Cl. 437-100.000.
Kubota, Akihiro; Sugiura, Rikio; Aoki, Tsuyoshi; and Ono, Michio, 4,984,059, Cl. 357-68.000.
Matsuhashi, Tomohiro; Kamata, Hideo; Yasuda, Masami; Kataoka, Satoshi; Inaoka, Hideyuki; and Watanabe, Eiichi, 4,984,281, Cl. 382-7.000.
Miura, Shuichi; Mikawa, Takashi; Kuwatsuka, Haruhiko; and Yasuoka, Nami, 4,984,032, Cl. 357-16.000.
Sano, Yoshiaki; Hanazawa, Toshio; Katagase, Yasuhide; Yasukouchi, Katsuyuki; Matsumoto, Takashi; and Fujihara, Susumu, 4,983,905, Cl. 323-274.000.
Sato, Yasuhisa; and Motoyama, Takushi, 4,983,543, Cl. 437-192.000.
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Tsukui, Setsuo, 4,983,053, Cl. 400-62.000.
Uno, Masaaki; Kobayashi, Masanori; and Nakashima, Kazushi, 4,983,548, Cl. 437-250.000.
Utsumi, Kenichi; Koshino, Nagaaki; Goto, Yasuyuki; Tsugawa, Iwao; and Nakada, Masahiro, 4,984,232, Cl. 369-277.000.
Watanabe, Toshiaki; Iguchi, Kazuo; and Soejima, Tetsuo, 4,984,238, Cl. 370-105.100.

Fujitsu Ten Limited: *See*—
Sano, Yoshiaki; Hanazawa, Toshio; Katagase, Yasuhide; Yasukouchi, Katsuyuki; Matsumoto, Takashi; and Fujihara, Susumu, 4,983,905, Cl. 323-274.000.
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Fujitsu VLSI Limited: *See—*
Sano, Yoshiaki; Hanazawa, Toshio; Katagase, Yasuhide; Yasukouchi, Katsuyuki; Matsumoto, Takashi; and Fujihara, Susumu, 4,983,905, Cl. 323-274.000.
Uno, Masaaki; Kobayashi, Masanori; and Nakashima, Kazushi, 4,983,548, Cl. 437-250.000.

Fukatani, Yasunobu, to Kabushiki Kaisha Daikin Seisakusho. Fluid clutch. 4,982,824, Cl. 192-85.0AB.

Fukaya, Chikara; Yasuda, Hitoshi; Akira, Toshiaki; Iwai, Masakazu; Okano, Kanemichi; and Yokoyama, Kazumasa, to Green Cross Corporation. Therapeutic and prophylactic agents for peptic ulcers. 4,983,584, Cl. 514-54.000.

Fukaya, Chikara: *See—*
Yasuda, Hitoshi; Fukaya, Chikara; Okano, Kanemichi; and Yokoyama, Kazumasa, 4,983,723, Cl. 536-4.100.

Fukikawa, Iwao: *See—*
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Fukuchi, Hiroyuki, to Kirin Beer Kabushiki Kaisha. Variable optical axis type bottle inspecting apparatus. 4,983,822, Cl. 250-223.00B.

Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, to Hitachi, Ltd. Semiconductor memory. 4,984,212, Cl. 365-230.030.

Fukuda, Yujiro; and Yamashita, Hiromi, to Diafoil Company, Ltd. Polyester shrinkable film containing benzotriazole. 4,983,653, Cl. 524-91.000.

Fukunaga, Yuichiro: *See—*
Sekine, Hiroshi; Yamaguchi, Mikio; Sadakata, Kiyoshi; and Fukunaga, Yuichiro, 4,983,143, Cl. 464-89.000.

Fukunaga, Yukio: *See—*
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Fukushima, Naoto: *See—*
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Fukushima, Yoshichika: *See—*
Matsuda, Toshiharu; Okumoto, Yoshinao; Fugiyama, Nobuyuki; and Fukushima, Yoshichika, 4,982,583, Cl. 62-244.000.

Fukushima, Yoshihisa: *See—*
Satoh, Isao; Fukushima, Yoshihisa; Takagi, Yuji; and Azumatani, Yasushi, 4,984,230, Cl. 369-54.000.

Fukuyama, Kensuke: *See—*
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu; Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, 4,982,979, Cl. 280-707.000.

Funahashi, Makoto: *See—*
Takada, Mitsuru; Itoh, Hiroshi; Takahashi, Tokuyuki; and Funahashi, Makoto, 4,982,624, Cl. 74-869.000.

Funski, Motokatsu. Device for incorporating layer member in face construction of building. 4,982,542, Cl. 52-401.000.

Funatsu, Koichi: *See—*
Yoshino, Toshihiko; Funatsu, Koichi; and Ishikawa, Keiichi, 4,982,623, Cl. 74-866.000.

Funayama, Naotaka, to Sharp Kabushiki Kaisha. Developing device with magnetic supply seals. 4,982,690, Cl. 118-657.000.

Funikawa, Hidenori: *See—*
Okamoto, Masamitsu; Wada, Masami; Funikawa, Hidenori; Kato, Haruo; and Shouji, Hideaki, 4,982,495, Cl. 29-846.000.

Funk, John G.: *See—*
Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James D.; and McCauley, Robert M., 4,983,282, Cl. 210-95.000.

Furtek, Allan B., to Mobil Oil Corporation. Process for polymerizing olefins to form polymers of narrow molecular weight distribution. 4,983,694, Cl. 526-125.000.

Furukawa, Akihiro: *See—*
Torii, Hiroshi; Oishi, Minoru; Ban, Tomohiro; Furukawa, Akihiro; Furushima, Tokihito; and Nakagawa, Kazuko, 4,984,162, Cl. 364-518.000.

Furukawa, Yuichi. Catheter for angiography. 4,983,169, Cl. 604-164.000.

Furushima, Tokihito: *See—*
Torii, Hiroshi; Oishi, Minoru; Ban, Tomohiro; Furukawa, Akihiro; Furushima, Tokihito; and Nakagawa, Kazuko, 4,984,162, Cl. 364-518.000.

Furuta, Isao: *See—*
Arima, Junichi; Hirata, Yoshihiro; Harada, Hiroshi; Furuta, Isao; Harada, Shigeru; and Tamaki, Reiji, 4,983,547, Cl. 437-246.000.

Furutachi, Nobuo: *See—*
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Furuyama, Kazuo. Coupling device for ornamental piece. 4,982,581, Cl. 63-29.100.

Fushimi, Kazuhiro: *See—*
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Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,983,751, Cl. 558-272.000.

Futura Medical S.A.: *See—*
Torres Zaragoza, Vicente M., 4,983,381, Cl. 424-53.000.

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Marsden, Peter D.; Fyson, John R.; and Twist, Peter J., 4,983,504, Cl. 430-398.000.

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Vara, Fulvio J.; and Dougherty, James A., 4,983,425, Cl. 427-340.000.

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Rossigno, Louis P.; Gaiser, Robert F.; and Temple, Robert B., 4,982,999, Cl. 303-9.630.

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Feller, W. Bruce; and Cook, Lee M., 4,983,551, Cl. 501-74.000.

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Bodine, John H.; Gallagher, John N.; and Wright, James H., 4,984,220, Cl. 367-68.000.

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Zavatteri, Ignazio; and Gambini, Tiziana, 4,983,666, Cl. 524-539.000.

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Delmas, Francis M.; and Gandais, Michel A., 4,983,075, Cl. 405-267.000.

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Cutter, Louis A.; Ganger, Richard A.; and Godfrey, John J., 4,983,668, Cl. 525-23.000.

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Chiappe, Wayne T.; and Gasquoine, Randy W., 4,983,095, Cl. 414-786.000.

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Froehlich, Peter; Gebauer, Ludwig; Hartmann, Manfred; Mirsberger, Helmut; and Moench, Monika, 4,983,083, Cl. 411-82.000.

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Knoedler, Roy E.; Parker, Robert M.; Au, William G.; and Gebhard, Albert W., 4,982,997, Cl. 297-29o.000.

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Sorge, Werner; and Konieczny, Klaus, 4,983,077, Cl. 405-288.000.

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Thuries, Edmond, 4,983,789, Cl. 200-148.00A.

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Geiger, Robert E.: *See—*
Kimberlin, Robert R.; Geiger, Robert E.; Speck, Frank; and Allis, Wayne, 4,983,152, Cl. 475-331.000.

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Holzer, Gerhard; and Gelderie, Udo, 4,983,464, Cl. 428-442.000.

Gem Industries Inc.: *See—*
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Li, May K.; McLaughlin, Donna; Palome, Elaine; and Kessler, Jack, 4,983,523, Cl. 435-173.000.

General Company Limited: *See—*
Ueyama, Seiji, 4,983,445, Cl. 428-212.000.

General Dynamics Land Systems, Inc.: *See—*
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Saint Felix, Didier; Rougee, Ann; and Trousset, Yves, 4,984,160, Cl. 364-413.190.

General Electric Company: *See—*
Bender-Zanoni, Joseph F.; Cook, Howard T., Jr.; Cozzy, Thomas W.; and Jarvis, Stephen A., 4,982,650, Cl. 89-34.000.
Benesch, Jay F., 4,983,942, Cl. 335-301.000.
Blackmon, Kenneth P.; Clagett, Donald C.; and Shafer, Sheldon J., 4,983,718, Cl. 528-336.000.
Boardman, Charles E.; and Maurer, John P., 4,983,353, Cl. 376-283.000.

Cline, Harvey E.; Lorensen, William E.; and Ludke, Siegwalt, 4,984,157, Cl. 364-413.130.
Fontana, Luca P.; Buckely, Paul W.; Harris, Denise Y.; and Boden, Eugene P., 4,983,706, Cl. 528-176.000.
Fox, Daniel W.; Peters, Edward N.; Riding, Geoffrey H.; and Willard, G. Fred, 4,983,719, Cl. 528-339.000.
Gross, David C.; Johnson, Donald S.; and Shannon, Connie H., 4,983,641, Cl. 521-82.000.
Gullberg, Grant T., 4,984,159, Cl. 364-413.160.
Henry, Michael F., 4,983,233, Cl. 148-428.000.
Hines, William R., 4,982,564, Cl. 60-39.550.
Imam, Imdad; and Carlson, Gerald J., 4,984,173, Cl. 364-508.000.
Jackson, Melvin R., 4,983,356, Cl. 420-35.000.
Kim, Bang M., 4,983,247, Cl. 156-272.200.
Le Roux, Patrick, 4,983,917, Cl. 324-306.000.
O'Donnell, Matthew; Engeler, William E.; Bloomer, John J.; and Pedicone, John T., 4,983,970, Cl. 341-122.000.
Roberts, Victor D., 4,983,889, Cl. 315-246.000.
Smith, Michael W.; and Heilman, Michael B., 4,984,294, Cl. 455-166.000.
Stokes, Vijay K., 4,982,856, Cl. 220-3.000.
Taub, Alan I.; and Miller, Mark L., 4,983,228, Cl. 148-133.000.
Waslo, Jennifer; Kuwata, Masayoshi; and Washam, Roy M., 4,982,570, Cl. 60-733.000.
Wei, Ching-Yeu, 4,983,537, Cl. 437-69.000.

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Lee, Rosemary A.; Samarakone, Nandasiri; and Cade, Neil A., 4,983,878, Cl. 313-308.000.
Woloszczuk, Edmund W., 4,983,986, Cl. 343-771.000.
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Mantese, Joseph V.; Micheli, Adolph L.; and Hamdi, Aboud H., 4,983,577, Cl. 505-1.000.

Georg Fischer AG: *See—*
Weimann, Wendelin, 4,982,778, Cl. 164-130.000.

Georg Karl geka-brush GmbH: *See—*
Fitjer, Holger, 4,982,838, Cl. 206-209.000.

Georgacakis, George D.: *See—*
Bogda, Richard C.; and Georgacakis, George D., 4,983,790, Cl. 200-30.00R.

Gerfast, Sten R.: *See—*
Backlund, Richard A.; and Gerfast, Sten R., 4,984,119, Cl. 360-128.000.

Gerharz, Gabriele: *See—*
Schuler, Claus; and Gerharz, Gabriele, 4,983,261, Cl. 204-30.000.

Germain, Michel; Gillet, Bruno; and Pasquiou, Jean-Yves, to Commissariat a l'Energie Atomique. Process for the reextraction in aqueous solution of the plutonium present in an organic solvent, more particularly usable for splitting uranium and plutonium. 4,983,300, Cl. 210-634.000.

Germain, Ronald T. Tool and method for removing the cap of an oil filter cartridge. 4,982,629, Cl. 81-176.100.

Gerritsen, Jan: *See—*
Mizusawa, Eugene A.; Paone, Donald J.; Casella, Tracey L.; Flores, Dorothy L.; Choy, Clement K.; Gerritsen, Jan; Heiskell, Ronald E.; Dewees, Thomas; and Ellgen, Jon L., 4,982,467, Cl. 8-158.000.

Gerwick, Ben C., III: *See—*
Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.

Gessa, Gian Luigi; Fadda, Fabio; and Mormile di Campochiaro, Chiara, to Laboratorio Farmaceutico C.T. S.r.l. Use of gamma-hydroxybutyric acid salts for preparing pharmaceutical compositions for use in the treatment of alcoholism, and the compositions obtained. 4,983,632, Cl. 514-557.000.

Gessner, Adolf W., to Chenpatents. Apparatus and method for reducing solvent vapor losses. 4,983,223, Cl. 134-25.400.

Ghenic, George. Hot dog roaster. 4,982,657, Cl. 99-421.00A.

Giani, Roberto P.; Parini, Ettore; and Tonon, Giancarlo, to Dompe Farmaceutici S.p.A. Pharmacologically active alkylthiobenzimidazole derivatives and process for the preparation thereof. 4,983,620, Cl. 514-395.000.

Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, to International Paper Company. Oxygen impermeable leak free container. 4,983,431, Cl. 428-34.200.

Gibson, David R., to Allergan, Inc. Methods and materials for use in corneal wound healing. 4,983,580, Cl. 514-2.000.

Gibson, James D.: *See—*
Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James D.; and McCauley, Robert M., 4,983,282, Cl. 210-95.000.

Giersberg, Joachim; and Kolimeier, Hans-Joachim, to Th. Goldschmidt AG. Phosphobetaines, methods for their synthesis and their use especially for industrial purposes. 4,983,750, Cl. 558-134.000.

Gillet, Bruno: *See—*
Germain, Michel; Gillet, Bruno; and Pasquiou, Jean-Yves, 4,983,300, Cl. 210-634.000.

Gillis, Herbert R.; and Hannaby, Malcolm, to ICI Americas Inc. Reaction injection molding compositions. 4,983,659, Cl. 524-186.000.

Gilreath, Charles T. Image transfer method. 4,983,487, Cl. 430-126.000.

Gilson, Richard E.; and Miller, Gary R., to Eastman Kodak Company. Treated anodized aluminum support and lithographic printing plate containing same. 4,983,497, Cl. 430-272.000.

Gimble, Richard, to Va Bien Ltd., Inc. Backless, strapless ladies' body briefer. 4,983,140, Cl. 450-27.000.

Giovene, Joseph P., Jr.: *See—*
Goetz, Kenneth E.; Hagarman, James A.; and Giovene, Joseph P., Jr., 4,983,550, Cl. 501-33.000.

Girard, Genevieve: *See—*
Cabaret, Louis; Girard, Genevieve; Pinson, Pierre; and De Saxce, Thibaut, 4,984,246, Cl. 372-69.000.

Glamkowski, Edward J.; and Kurys, Barbara E., to Hoechst-Roussel Pharmaceutical Inc. Benzo(b)pyrrolobenzodiazepines. 4,983,601, Cl. 514-219.000.

Glaser, Heinz: *See—*
Dotzer, Peter; Glaser, Heinz; Mayr, Ernst; and Oestreich, Ulrich, 4,983,013, Cl. 350-96.230.

Glass Master Corporation: *See—*
Cunningham, Robert A., Jr., 4,983,081, Cl. 83-39.000.

Glaxo Group Limited: *See—*
Bunce, Keith T.; and Humphrey, Patrick P. A., 4,983,621, Cl. 514-397.000.

Gleason, Curtis A.: *See—*
Lue, Tom F.; Tanagho, Emil E.; Schmidt, Richard A.; and Gleason, Curtis A., 4,982,731, Cl. 128-79.000.

Globe Products Inc.: *See—*
Seitz, David R.; Finegold, Hyman B.; and Heaton, Mark T., 4,982,827, Cl. 198-341.000.

Glogan, David J.: *See—*
Meiszahl, William J.; Glogan, David J.; and Burnham, William L., 4,983,999, Cl. 354-149.110.

Glogowski, Mark W.; Hartman, Frederick A.; Heinzman, Stephen W.; and Perkins, Christopher M., to Procter & Gamble Company, The. N,N'-(1-oxo-1,2-ethanediyl)-bis(aspartic acid), salts and use in detergent compositions. 4,983,315, Cl. 252-102.000.

Glover, Alfred H.; Betterton, Joseph T.; and Hepler, Bruce, to Acustar, Inc. Printed wiring board stand-off guide. 4,982,847, Cl. 211-41.000.

Glover, Alfred H.: *See—*
Betterton, Joseph T.; Glover, Alfred H.; and McKee, Thomas S., 4,982,607, Cl. 73-725.000.

Gmelin, Karl, to Robert Bosch GmbH. Apparatus for actuating a throttle valve in internal combustion engines. 4,982,711, Cl. 123-399.000.

GN Danovox A/S: *See—*
Bisgaard, Peter N.; and Ooms, Simon, 4,984,277, Cl. 381-69.200.

Go, Tiong C., to Irvine Sensors Corporation. High-density electronic modules - process and product. 4,983,533, Cl. 437-7.000.

Godfrey, John J.: *See—*
Cutter, Louis A.; Ganger, Richard A.; and Godfrey, John J., 4,983,668, Cl. 525-23.000.

Goedecke, Hans-Joachim. Protective envelope for a camera. 4,982,841, Cl. 206-316.200.

Goetz, Allan: *See—*
Graybill, Mark; and Goetz, Allan, 4,984,187, Cl. 364-724.170.

Goetz, Kenneth E.; Hagarman, James A.; and Giovene, Joseph P., Jr., to Potters Industries, Inc. Hollow glass spheres. 4,983,550, Cl. 501-33.000.

Goggia, Steven J. Pop-up landscape light. 4,984,139, Cl. 362-153.100.

Goghova, Marcela: *See—*
Humplik, Antonin; Benckova, Maria; Caucik, Pavol; Durmis, Julius; Goghova, Marcela; Karvas, Milan; Orlik, Ivo; and Povazancova, Marta, 4,983,657, Cl. 524-120.000.

Goi, Takahiro: *See—*
Kuwata, Satoshi; Goi, Takahiro; Shimizu, Takaaki; and Ogihara, Tsutomu, 4,983,388, Cl. 424-401.000.

Goisser, Siegfried: *See—*
Straihammer, Reinhard; Schuss, Werner; Goisser, Siegfried; and Beerstecher, Lutz, 4,983,121, Cl. 433-114.000.

Gokan, Hiroshi; Mukainaru, Masahito; Suzuki, Masayoshi; Tsuge, Hisanao; and Matsuya, Hidehiko, to NEC Corporation; and Sanyo Chemical Industries, Ltd. Planarization of dielectric films on integrated circuits. 4,983,545, Cl. 437-228.000.

Goldsmith, Robert L., to CeraMem Corporation. Method of forming a porous inorganic membrane on a porous support using a reactive inorganic binder. 4,983,423, Cl. 427-230.000.

Goldstar Co., Ltd.: *See—*
Hwang, Hak S., 4,984,105, Cl. 360-85.000.

Goldstein, Allan; and Wang, Su-Sun, to Viral Technologies Inc. HIV related peptides, immunogenic antigens, and use therefor as subunit vaccine for AIDS virus. 4,983,387, Cl. 424-88.000.

Golovoy, Amos: *See—*
Cheung, Mo-Fung; Golovoy, Amos; and van Oene, Henk, 4,983,654, Cl. 524-100.000.

Good, Mary L.: *See—*
Yates, Stephen F.; Good, Mary L.; and Brubaker, Inara M., 4,983,670, Cl. 525-54.200.

Goodwin, George B.: *See—*
Franz, Helmut; and Goodwin, George B., 4,983,459, Cl. 428-410.000.

Goodyear Tire & Rubber Company, The: *See—*
Bonko, Mark L., 4,982,773, Cl. 152-209.00B.
Kuzma, Leonard J.; and Castner, Kenneth F., 4,983,695, Cl. 526-142.000.
Sikora, Leonard A., 4,983,729, Cl. 536-28.000.
Weinstein, Arthur H.; Colvin, Howard A.; and Parker, Dane K., 4,983,684, Cl. 525-329.100.

Gora, Heinz-Jurgen, to Eppendorf-Netheler-Hinz GmbH. Process of taking liquid from large-volume, deep vessels by means of sucking

vessels and auxiliary sucking device for use with large-volume, deep vessels in carrying out that process. 4,982,614, Cl. 73-863.810.

Gordon, Jimmy A.: *See*—
Gordon, Russell B.; Gordon, Jimmy A.; and Smith, Marion W., 4,982,653, Cl. 98-39.100.

Gordon, Richard A. Ferret harness. 4,982,700, Cl. 119-96.000.

Gordon, Roy G.; and Hofer, Peter H., to Libbey-Owens-Ford Co. Device for measuring the flow of a gas containing particulates. 4,982,610, Cl. 73-861.620.

Gordon, Russell B.; Gordon, Jimmy A.; and Smith, Marion W., to Saddle Vent, Inc. Method and apparatus for ventilating an enclosure accessed by a manhole. 4,982,653, Cl. 98-39.100.

Gorunov, Valery E.: *See*—
Stepanenko, Alexandr V.; Vereschagin, Mikhail N.; Paly, Oleg I.; Sheleg, Valery K.; Kaptsevich, Vyacheslav M.; Gorunov, Valery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V., 4,982,780, Cl. 164-463.000.

Goto, Joji: *See*—
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.

Goto, Kenjiro, to Hitachi, Ltd. Cipher system with closed cipher procedure. 4,984,271, Cl. 380-25.000.

Goto, Masahito: *See*—
Hibino, Hiroki; Nagayama, Yoshikatsu; Yoshikawa, Mutsumi; Takara, Toshiyuki; Goto, Masahito; Suzuki, Akira; Takehana, Sakae; Oaki, Yoshinao; Yoshimitsu, Koichi; and Aoki, Yoshisada, 4,982,725, Cl. 128-4.000.

Goto, Sohei: *See*—
Ohbayashi, Keiji; Komamura, Tawara; Goto, Sohei; and Ohya, Hidenobu, 4,983,502, Cl. 430-353.000.

Goto, Yasuyuki: *See*—
Utsumi, Kenichi; Koshino, Nagaaki; Goto, Yasuyuki; Tsugawa, Iwao; and Nakada, Masahiro, 4,984,232, Cl. 369-277.000.

Gotou, Hiroshi, to Fujitsu Limited. Method for fabricating a silicon carbide substrate. 4,983,538, Cl. 437-100.000.

Grace GmbH: *See*—
Obermuller, Herbert J., 4,983,362, Cl. 422-173.000.

Gradwohl, Adolf, to Binder & Co. Aktiengesellschaft. Device for smoothing out and pressing together the free projecting end extending over the filling material of filled sacks. 4,982,557, Cl. 53-371.000.

Graeger, Volker; Kobs, Rolf U. D.; Schafer, Horst; and Zeile, Heinrich, to U.S. Philips Corporation. Silicon pressure sensor having a resistance layer of polycrystalline semicondutor. 4,984,046, Cl. 357-26.000.

Graham, Gary R. Console color display. 4,984,138, Cl. 362-85.000.

Graham, Richard T. Head covering device. 4,982,451, Cl. 2-410.000.

Grant, Frederic F.; and Grant, John P., to Datatape Incorporated. Apparatus for transporting magnetic tape cassettes of different sizes. 4,984,108, Cl. 360-92.000.

Grant, Frederic F.: *See*—
Mondocea, Ionel; Grant, John P.; and Grant, Frederic F., 4,984,107, Cl. 360-92.000.

Grant, John P.: *See*—
Grant, Frederic F.; and Grant, John P., 4,984,108, Cl. 360-92.000.
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Graske, Wilhelm. Glider-canopy. 4,982,917, Cl. 244-145.000.

Gray, Warren E., to Northrop Corporation. Double locked threaded fastener. 4,983,084, Cl. 411-311.000.

Gray, Warren E., to Northrop Corporation. Threaded lockable fastener with swaged collar. 4,983,085, Cl. 411-361.000.

Graybill, Mark; and Goetz, Allan, to Hughes Aircraft Company. First order recursive digital filter without multiplier. 4,984,187, Cl. 364-724.170.

Grebinski, Thomas J., Jr.; and Stephenson, Samuel H., to National Semiconductor Corporation. Wafer etching, cleaning and stripping apparatus. 4,982,753, Cl. 134-95.000.

Green, Alan C.; and Eeles, Richard, to Penlon Limited. Anaesthesia equipment. 4,982,734, Cl. 128-200.140.

Green Cross Corporation: *See*—
Fukaya, Chikara; Yasuda, Hitoshi; Akira, Toshiaki; Iwai, Masakazu; Okano, Kanemichi; and Yokoyama, Kazumasa, 4,983,584, Cl. 514-54.000.
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,983,605, Cl. 514-247.000.
Yasuda, Hitoshi; Fukaya, Chikara; Okano, Kanemichi; and Yokoyama, Kazumasa, 4,983,723, Cl. 536-4.100.

Green, George A.: *See*—
Kaczmarek, Stanislaus A.; Shah, Piyush S.; and Green, George A., 4,983,297, Cl. 210-605.000.

Green, George R.: *See*—
Green, Gregory R.; and Green, George R., 4,983,222, Cl. 134-22.100.

Green, Gregory R.; and Green, George R., to Union Carbide Chemicals and Plastics Company Inc. Vapor solvent decontamination of PCB transformer components. 4,983,222, Cl. 134-22.100.

Green, Kenneth: *See*—
Wissner, Allan; Green, Kenneth; and Schaub, Robert E., 4,983,592, Cl. 514-92.000.

Gregoli, Armand A.; Olah, Andrew M.; Hamshar, John A.; and Rimmer, Daniel P., to Canadian Occidental Petroleum Ltd. Preparation of low-viscosity improved stable crude oil transport emulsions. 4,983,319, Cl. 252-314.000.

Greif Brothers Corporation: *See*—
Dubois, Robert A.; and Caron, Richard A., 4,982,867, Cl. 220-403.000.

Greiner, Gabriele, to Lindemann Maschinenfabrik G.m.b.H. Screen for comminuting machines. 4,982,904, Cl. 241-73.000.

Gressett, Charles A., Jr.; and Smith, Gregg L., to Adams Rite Manufacturing Company. Lever/knob actuated entry mechanism. 4,982,986, Cl. 292-336.300.

Greve, Bruce N., to Budd Company, The. Method for recycling plastic composite materials. 4,983,549, Cl. 501-27.000.

Grey, Mark I., to Conoco Specialty Products Inc. Cyclone separator. 4,983,283, Cl. 210-104.000.

Griebel, Heinrich: *See*—
Kille, Ewald; and Griebel, Heinrich, 4,982,899, Cl. 239-329.000.

Griebel, Peter, to Dr. Madaus GmbH. Diagnostic apnea monitor system. 4,982,738, Cl. 128-670.000.

Griffaton, Jacques, to Framatome. Method and apparatus for remote welding inside a tube, in particular in a steam generator in a nuclear power station. 4,983,796, Cl. 219-121.630.

Griffin, Gerald J. L., to Epron Industries Limited. Degradable plastics. 4,983,651, Cl. 524-47.000.

Grimes, John F. Liquid level gauge for tanks. 4,983,855, Cl. 250-577.000.

Grob, Urs: *See*—
Kaufmann, Hans; Kueng, Roland; Grob, Urs; and Welti, Arnold, 4,984,247, Cl. 375-1.000.

Groehl, Lawrence R., to United States of America, Army. Null offset voltage compensation for operational amplifiers. 4,983,926, Cl. 330-51.000.

Grone, Donald J.; and Kelsey, Randy J., to Westinghouse Electric Corp. High-speed universal scaler. 4,983,966, Cl. 341-84.000.

Gross, David C.; Johnson, Donald S.; and Shannon, Connie H., to General Electric Company. Method for controlling the cure rate of silicone foam. 4,983,641, Cl. 521-82.000.

Grote & Hartmann GmbH & Co. KG: *See*—
Zollner, Manfred, 4,983,236, Cl. 156-52.000.

Gruber, Leopold R.: *See*—
Theurer, Josef; Hansmann, Johann, deceased; Oellerer, Friedrich; and Gruber, Leopold R., 4,983,801, Cl. 219-54.000.

Grudno, Hans-Dieter: *See*—
Holsiepe, Dietmar; Lohnherr, Ludger; Grudno, Hans-Dieter; and Zigan, Bernhard, 4,982,905, Cl. 241-79.100.

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Mantese, Joseph V.; Micheli, Adolph L.; and Hamdi, Aboud H., 4,983,577, Cl. 505-1.000.

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Hartmann, Manfred: *See—*
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Hashimoto, Yasuhiro: *See*—
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Hastert, James L.: *See*—
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Hata, Koji: *See*—
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Hatanaka, Ryuichi: *See*—
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Hauck, Bobbie W., to Wenger Manufacturing, Inc. Inlet for twin screw extruder. 4,983,114, Cl. 425-203.000.

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Hayashi, Daisuke: *See*—
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Hayward Industries, Inc.: *See*—
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Heaton, Mark T.: *See*—
Seitz, David R.; Finegold, Hyman B.; and Heaton, Mark T., 4,982,827, Cl. 198-341.000.

Hebsur, Mohan G.; and Stephens, Joseph R., to Sverdrup Technology, Inc. Niobium-aluminum base alloys having improved, high temperature oxidation resistance. 4,983,358, Cl. 420-425.000.

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Heiskell, Ronald E.: *See*—
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Henkel Corporation: *See*—
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Henkel, Hans-Joachim; Markert, Helmut; Roth, Wolfgang; and Kautek, Wolfgang, to Siemens Aktiengesellschaft. Method for generating thin layers on a silicone base. 4,983,419, Cl. 427-53.100.

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Ploog, Uwe, 4,983,778, Cl. 568-618.000.
Steinbach, Gerhard, 4,983,060, Cl. 401-140.000.

Henkin, Melvyn L.; and Laby, Jordan M. Adjustable air and water entrainment hydrotherapy jet assembly. 4,982,459, Cl. 4-541.000.

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Henry, Michael F., to General Electric Company. Fatigue crack resistant nickel base superalloys and product formed. 4,983,233, Cl. 148-428.000.

Henson, Anthony E., to Albion Hat & Cap Company Pty. Ltd. Body protector. 4,982,447, Cl. 2-2.000.

Hepler, Bruce: *See*—
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Berger, Terry A., 4,982,597, Cl. 73-23.100.
Hiller, Donald R., 4,983,906, Cl. 324-79.00D.
Hillstrom, Timothy L., 4,983,924, Cl. 328-72.000.

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Bryker, William; and Avila, Luis A., 4,983,771, Cl. 564-304.000.

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Gallagher, Peter T.; and Hicks, Terence A., 4,983,619, Cl. 514-371.000.

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Ohgushi, Katsunori; Hijiri, Masao; and Kitazawa, Zenwemon, 4,983,814, Cl. 219-545.000.

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Fujimura, Shuzo; Shinagawa, Keisuke; and Hikazutani, Kenichi, 4,983,254, Cl. 156-643.000.

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Froehlich, Peter; Gebauer, Ludwig; Hartmann, Manfred; Mirsberger, Helmut; and Moench, Monika, 4,983,083, Cl. 411-82.000.
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Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,983,208, Cl. 71-92.000.

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Hirata, Yoshihiro: *See*—
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Hirayama, Noriaki: *See*—
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.

Hirobe, Yoshiaki: *See*—
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Hino, Takashi; Kurodo, Hiroyuki; and Hirokawa, Kaoru, 4,983,457, Cl. 428-367.000.

Hirokawa, Yoshitsugu: *See*—
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Hirose, Hiroaki: *See*—
Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,983,751, Cl. 558-272.000.
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Hirose, Toshifumi: *See*—
Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 4,983,700, Cl. 528-34.000.
Hirota, Sadao: *See*—
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, 4,983,725, Cl. 536-4.100.
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Tanisake, Hiroka; Yamamoto, Koji; Hirota, Toshizumi; and Maruo, Kazunobu, 4,983,707, Cl. 528-193.000.
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Hitachi Automotive Engineering Co.: *See*—
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Ohta, Kenji; Horikoshi, Shigeru; and Sugawara, Hayato, 4,982,710, Cl. 123-399.000.
Hitachi Automotive Engineering Co., Ltd.: *See*—
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Hitachi Cable, Ltd.: *See*—
Kanzawa, Ryosaku; Takahashi, Ken; Sano, Hisumi; and Kurata, Kazuhiro, 4,984,035, Cl. 357-17.000.
Hitachi Chemical Co., Ltd.: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 4,983,488, Cl. 430-137.000.
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Hitachi Electronics Service Co., Ltd.: *See*—
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Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.
Doi, Nobukazu; Izumita, Morishi; Mita, Seiichi; and Eto, Yoshizumi, 4,983,965, Cl. 341-72.000.
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,984,212, Cl. 365-230.030.
Goto, Kenjiro, 4,984,271, Cl. 380-25.000.
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Igarashi, Osamu; Shibata, Takanori; Matuoka, Yoji; Watanabe, Kazuhiro; and Terashima, Kunio, 4,983,951, Cl. 340-461.000.
Itou, Masaaki; and Moriyama, Shigeo, 4,984,259, Cl. 378-146.000.
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Kinoshita, Yasuaki; Kubota, Sadami; and Takeda, Shigeru, 4,983,937, Cl. 333-202.000.
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.
Komuro, Matahiro; Kozono, Yuzo; Narishige, Shinji; and Hanazono, Masanobu, 4,983,575, Cl. 505-001.000.
Maeda, Ryoichi; Kadomukai, Yuzo; and Yamakado, Makoto, 4,982,707, Cl. 123-192.00B.
Masaki, Ryoso; Kayama, Masahiro; Hayashida, Hiroshi; Nihei, Hideki; Katayama, Yasunori; Nagase, Hiroshi; Matsuda, Toshihiko; and Kamiyama, Kenzo, 4,983,875, Cl. 310-323.000.
Matsuda, Toshiharu; Okumoto, Yoshinao; Fugiyama, Nobuyuki; and Fukushima, Yoshichika, 4,982,583, Cl. 62-244.000.
Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, 4,983,532, Cl. 437-31.000.
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Murai, Fumio; and Okazaki, Shinji, 4,983,864, Cl. 250-492.200.
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Ohki, Hiroshi; Miyake, Ryo; Yamazaki, Isao; and Takahata, Fujiya, 4,983,038, Cl. 356-246.000.
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Okamoto, Kaneyuki; Nishijima, Hideo; Masuda, Michio; Ohtsubo, Hiroyasu; and Ono, Koichi, 4,984,083, Cl. 358-183.000.
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, 4,984,048, Cl. 357-34.000.
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Sunami, Hideo; Kure, Tokuo; Kawamoto, Yoshifumi; Tamura, Masao; and Miyao, Masanobu, 4,984,030, Cl. 357-23.600.
Sunami, Hideo; Ohkura, Makoto; Miyao, Masanobu; Kusukawa, Kikuo; Moniwa, Masahiro; Kimura, ShinIchiro; Warabisako, Terunori; and Kure, Tokuo, 4,984,038, Cl. 357-23.600.
Suzuki, Kaoru; Kaneko, Mamoru; and Kanari, Matsukichi, 4,984,239, Cl. 371-3.000.
Suzuki, Yukio; Masuda, Ikuro; Iwamura, Masahiro; Kadono, Shinji; Uragami, Akira; Yoshimura, Masayoshi; and Matsubara, Toshiaki, 4,983,862, Cl. 307-446.000.
Takahashi, Toshihiro; Ito, Koichi; and Tobita, Hideyuki, 4,982,468, Cl. 8-159.000.
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,984,115, Cl. 360-106.000.
Takayama, Norikazu; Ushijima, Nobuyoshi; Kobashi, Tetsuzo; Sato, Masahiko; Yano, Yoshihiko; Isozaki, Jun; Fujii, Kousuke; and Kudoh, Yoshinobu, 4,984,100, Cl. 360-49.000.
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Yoshida, Isamu; Saeki, Junichi; Tsunoda, Shigeharu; Nishi, Kunihiko; and Mitani, Masao, 4,983,110, Cl. 425-116.000.
Hitachi Maxell, Ltd.: *See*—
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Endoh, Minoru; Nozawa, Yasuto; Iwasaki, Katsunori; Tanigawa, Shigeho; and Tokunaga, Masaaki, 4,983,232, Cl. 148-302.000.
Iyori, Yuusuke; and Yokoo, Hidetoshi, 4,983,212, Cl. 75-238.000.
Kinoshita, Yasuaki; Kubota, Sadami; and Takeda, Shigeru, 4,983,937, Cl. 333-202.000.
Nakajima, Shin; Yamataka, Akira; Shimizu, Hideaki; Yamauchi, Kiyotaka; and Arakawa, Shunsuke, 4,983,859, Cl. 307-419.000.
Hitachi Microcomputer Engineering, Ltd.: *See*—
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Hitachi Seiki Co., Ltd.: *See*—
Otani, Atsushi; Shirotori, Hidefumi; Morikawa, Nobuyuki; and Otani, Shunsuke, 4,982,970, Cl. 279-123.000.
Hitachi Seiko, Ltd.: *See*—
Irie, Akira; Kanaya, Yasuhiko; and Ohtani, Tamio, 4,982,831, Cl. 198-617.000.
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 4,983,802, Cl. 219-69.120.
Hitachi Software Engineering Co., Ltd: *See*—
Nakayashiki, Susumu; Kashio, Jiro; Matsumura, Hisashi; Wada, Hiroyuki; Sako, Yoshihito; Matsuura, Fumiaki; and Kajiya, Ihei, 4,984,233, Cl. 370-16.000.
Hitachi Tobu Semiconductor, Ltd.: *See*—
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Hite, Russell E.: *See*—
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Hitotsuya, Masaki: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

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Hock, Franz: *See*—
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Turner, Anthony P. F.; Hodges, Alan P.; Franklin, Ann; Ramsay, Graham; and Steel, Davina, 4,983,516, Cl. 435-34.000.

Hodgetts, John L.; and Hodson, Martin J., to Raytel Group Limited, The. Electromagnetic communication interface. 4,983,963, Cl. 340-870.310.

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Hodgetts, John L.; and Hodson, Martin J., 4,983,963, Cl. 340-870.310.

Hodson, Price R.: *See*—
Oram, James W.; Hodson, Price R.; and Haake, Paul F., 4,982,605, Cl. 73-204.190.

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Crass, Guenther; Janocha, Siegfried; and Bothe, Lothar, 4,983,447, Cl. 428-216.000.
Henning, Rainer; Urbach, Hansjorg; and Hock, Franz, 4,983,623, Cl. 514-414.000.
Rode, Klaus; Mohr, Dieter; and Frass, Werner, 4,983,498, Cl. 430-284.000.
Ruckert, Hans, 4,983,501, Cl. 430-326.000.
Stahlhofen, Paul; and Mohr, Dieter, 4,983,478, Cl. 430-14.000.
Weithmann, Klaus U.; and Seiffge, Dirk, 4,983,514, Cl. 435-29.000.

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Choe, Eui W.; Buckley, Alan; Stuetz, Dagobert E.; and Garito, Anthony F., 4,983,325, Cl. 252-600.000.
Domeshek, Kenneth A.; and Zazzara, Karen L., 4,983,730, Cl. 536-69.000.
Durham, Dana, 4,983,490, Cl. 430-169.000.
Yang, Nan L.; Auerbach, Andrew; Pesce, Rose.; Broussard, Jerry A.; and Paul, James L., 4,983,708, Cl. 528-230.000.

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Glamkowski, Edward J.; and Kurys, Barbara E., 4,983,601, Cl. 514-219.000.

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Effland, Richard C.; Klein, Joseph T.; Olsen, Gordon E.; Davis, Larry; Hamer, Russell R. L.; and Freed, Brian S., 4,983,615, Cl. 514-337.000.
O'Malley, Gerard J.; Allen, Richard C.; and White, John I., 4,983,616, Cl. 514-339.000.

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Effland, Richard C.; Klein, Joseph T.; Davis, Larry; and Olsen, Gordon E., 4,983,608, Cl. 514-256.000.

Hofer, Peter H.: *See*—
Gordon, Roy G.; and Hofer, Peter H., 4,982,610, Cl. 73-861.620.

Hoffman, Barry E.: *See*—
Audeh, Costandi A.; Hoffman, Barry E.; and Kirker, Garry W., 4,983,277, Cl. 208-252.000.

Hoffmann-La Roche Inc.: *See*—
Barbier, Pierre; Schneider, Fernand; and Widmer, Ulrich, 4,983,746, Cl. 549-328.000.

Hofmann Werkstatt-Technik GmbH: *See*—
Rothamel, Karl, 4,984,126, Cl. 361-144.000.

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Cha, Chang Y.; Duc, Michael; and Hogan, Curtis J., 4,983,278, Cl. 208-407.000.

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Ohasi, Tamiyosi; Mizuno, Masami; Aoki, Tomohide; and Hokari, Osamu, 4,982,757, Cl. 137-202.000.

Hokukoku, Shusaburo: *See*—
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, 4,983,725, Cl. 536-4.100.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Nishino, Hiroyuki; and Sakaguchi, Jun, 4,983,633, Cl. 514-622.000.

Holbrook, Gerald L.; Leising, Maurice B.; Benford, Howard L.; and Mehta, Hemang S., to Chrysler Corporation. Method of learning for adaptively controlling an electronic automatic transmission system. 4,982,620, Cl. 74-731.100.

Holbrook, Gerald L., to Chrysler Corporation. Bleeder ball check valves in an automatic transmission. 4,982,826, Cl. 192-106.00F.

Holl, Timothy: *See*—
Aylward, J. Richard; Holl, Timothy; and Keezer, William J., 4,984,273, Cl. 381-1.000.

Hollingsworth GmbH: *See*—
Schmolke, Karl-Heinz, 4,983,808, Cl. 219-121.640.

Hollister Incorporated: *See*—
Schneider, Barry L., 4,982,736, Cl. 128-400.000.

Hollister, William H., to Concord/Portex. Safety needle container. 4,982,842, Cl. 206-365.000.

Holloway, Bertram A., to Washington Steel Corporation. Gripper means for stretcher leveler apparatus. 4,982,593, Cl. 72-302.000.

Holloway, Thomas F., to Risdon Corporation. Dispenser for cosmetic preparations. 4,983,059, Cl. 401-78.000.

Holroyd, Colin: *See*—
Holroyd, Eric; Holroyd, Colin; Sumner, Anthony J. M.; and Wright, Anthony R., 4,983,239, Cl. 156-123.000.

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Holsiepe, Dietmar; Lohnherr, Ludger; Grudno, Hans-Dieter; and Zigan, Bernhard, to Krupp Polysius AG. Apparatus for crushing materials. 4,982,905, Cl. 241-79.100.

Holtmyer, Marlin D.; Hunt, Charles V.; and Harms, Weldon M., to Halliburton Company. Crosslinkable cellulose derivatives. 4,982,793, Cl. 166-305.100.

Holzer, Gerhard; and Gelderie, Udo, to Saint Gobain Vitrage. Anti-fire glazing. 4,983,464, Cl. 428-442.000.

Holzgrefe, Volker, to Robert Bosch GmbH. Injection valve. 4,982,901, Cl. 239-533.120.

Holzhauer, Horst; Loffler, Eberhard; and Kneib, Rudi, to Daimler-Benz AG. Telephone bracket, in particular for vehicles. 4,984,269, Cl. 379-454.000.

Homberger, Gunter: *See*—
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Homeyer, Bernhard: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Kimura, Shizuo; Watano, Yukihisa; Yamashita, Sachihiro; and Enomoto, Masayuki, 4,982,891, Cl. 228-47.000.
Nakazawa, Takeshi; Hashimoto, Jun; Nakamura, Shinichi; Yamazaki, Katsumi; Nakajima, Yoshihiro; Hayashi, Tsutomu; Ichikawa, Tetsuya; Yakigaya, Nobuyuki; Katahira, Kiyoshi; and Takeshima, Yoshinobu, 4,984,161, Cl. 364-424.100.
Noguchi, Hiroyuki; and Springer, Cort, 4,982,492, Cl. 29-446.000.
Otagawa, Atsushi; and Okabe, Toshio, 4,982,486, Cl. 29-527.400.
Saito, Kazuhiko; Yokoyama, Kazuhiko; and Kimura, Yoshihiro, 4,982,973, Cl. 280-152.100.
Tsujii, Gen, 4,984,171, Cl. 364-477.000.
Yokota, Chitoshi; Kawano, Minoru; Sueyoshi, Masahiko; Nishida, Toshiro; Setoguchi, Shohachi; and Fujimoto, Akira, 4,982,984, Cl. 292-201.000.
Yoshino, Toshihiko; Funatsu, Koichi; and Ishikawa, Keiichi, 4,982,623, Cl. 74-866.000.

Honda, Hironori: *See*—
Takemura, Masakazu; Honda, Hironori; and Terasaka, Masayuki, 4,983,477, Cl. 429-222.000.

Honda, Mitsuru; and Kubo, Takahiro, to Canon Kabushiki Kaisha. Developing apparatus having a developing roller with fine concavities. 4,982,689, Cl. 118-656.000.

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Yanagihara, Takeshi; Honda, Tsugio; Nakano, Makoto; and Kajino, Hiroshi, 4,983,450, Cl. 428-283.000.

Honeycut, Joseph W.: *See*—
Church, David F.; Urbowicz, Michael B.; and Honeycut, Joseph W., 4,982,848, Cl. 211-55.000.

Honeywell Inc.: *See*—
Haugen, John M., 4,982,489, Cl. 29-402.010.
Jungkman, David L., 4,983,018, Cl. 350-167.000.

Hong, Hei-Tai, to Industrial Technology Research Institute. High speed transceiver. 4,984,248, Cl. 375-7.000.

Honma, Kazuhiro: *See*—
Takeya, Naoya; Honma, Kazuhiro; and Matsuda, Kiyofumi, 4,983,004, Cl. 350-3.660.

Honma, Yoshiaki: *See*—
Taguchi, Kazuo; and Honma, Yoshiaki, 4,982,675, Cl. 112-121.120.

Hook, Karl-Axel; Nilson, Nils B.; and Wellenstam, Kjell I., to Astra Meditec AB. Automatic two-chamber injector. 4,983,164, Cl. 604-87.000.

Hoover, Linn C.: *See*—
Derimiggio, John E.; and Hoover, Linn C., 4,984,027, Cl. 355-290.000.

Hope, Lawrence L.: *See*—
Abdalla, Mohamed I.; Hope, Lawrence L.; and Fohl, Timothy, 4,983,880, Cl. 313-506.000.

Hopkins, Jeffrey A.; McGuinness, Roger M.; Agrawal, Rakesh; and Feldman, Steven L., to Air Products and Chemicals, Inc. Production of high purity argon. 4,983,194, Cl. 62-22.000.

Horikoshi, Shigeru: *See*—
Ohta, Kenji; Horikoshi, Shigeru; and Sugawara, Hayato, 4,982,710, Cl. 123-399.000.
Hornung, Stephen: *See*—
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Horodysky, Andrew G.: *See*—
Benjamin, Linda A.; Horodysky, Andrew G.; Law, Derek A.; and Wu, Shi-Ming, 4,983,310, Cl. 252-32.70E.
Horowitz, Stephen M. Hip prosthesis and method for implanting the same. 4,983,183, Cl. 623-23.000.
Horstketter, Eugene A. Concrete panels, concrete decks, parts thereof, and apparatus and methods for their fabrication and use. 4,982,538, Cl. 52-259.000.
Hosel, Fritz, to Trutzschler GmbH & Co. KG. Method and apparatus for detecting sliver feed. 4,982,477, Cl. 19-0.250.
Hoshizaki Denki Kabushiki Kaisha: *See*—
Tatematsu, Susumu; Tsukiyama, Yasumitsu; and Hida, Junichi, 4,982,573, Cl. 62-135.000.
Hosoe, Kazunori: *See*—
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Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yanase, Yoshiyuki, 4,983,079, Cl. 408-230.000.
Hosoya, Norio; and Yoneyama, Shigeyuki, to Hattori, Ken-Ichi. Method and apparatus for finishing gear tooth surfaces of a bevel gear. 4,982,532, Cl. 51-287.000.
Hotta, Shu: *See*—
Soga, Mamoru; Hotta, Shu; and Sonoda, Nobuo, 4,983,696, Cl. 526-159.000.
Houard, Sophie: *See*—
Herzog, Albert; Cravador, Alfredo; Houard, Sophie; and Bollen, Alex, 4,983,728, Cl. 536-27.000.
Hougaard, Finn, to Eskofot A/S. Reproduction camera comprising a scanning light source. 4,984,014, Cl. 355-67.000.
Houot, Jean-Jacques, to Societe Nationale Elf Aquitaine (Production). Apparatus for oil/gas separation at an underwater well-head. 4,982,794, Cl. 166-357.000.
Hour, Jenn-Chyan. Pen holder with puzzle blocks. 4,983,062, Cl. 401-195.000.
House Food Industrial Company Limited: *See*—
Sengoku, Koji; and Namba, Misako, 4,983,414, Cl. 426-634.000.
Hovis, James E.; and Finke, Harry P., to Bloom Engineering Company, Inc. Low NOx regenerative burner. 4,983,118, Cl. 431-115.000.
Hovis, John C.: *See*—
Deb, Sugato; Hovis, John C.; and Pollock, Michael L., 4,983,202, Cl. 65-104.000.
Hoya Corporation: *See*—
Ogino, Kazuo, 4,983,198, Cl. 65-32.500.
Hrycak, Peter D., to Westinghouse Electric Corp. Architecture for monopulse active aperture arrays. 4,983,977, Cl. 342-153.000.
Hsieh, Martin Y., to GTE Products Corporation. Silicon nitride ceramic containing molybdenum disilicide. 4,983,554, Cl. 501-97.000.
Huang, Der-Shing; and Rindone, Renato R., to Aerojet General Corporation. High-energy insensitive cyclic nitramines. 4,983,734, Cl. 544-194.000.
Hubl, Dieter: *See*—
Buhmann, Ulrich; Hubl, Dieter; and Pieroh, Ernst-Albrecht, 4,983,755, Cl. 560-24.000.
Hudson, Eric B., to Tecumseh Products Company. Cam pulley and cylinder head arrangement for an overhead cam engine. 4,982,705, Cl. 123-41.650.
Huerlimann, Peter: *See*—
Angeloz, Corinne; Huerlimann, Peter; Schmied, Rudolf; and Van Meir, Eugene, 4,982,880, Cl. 222-490.000.
Huets, Martinus P. J.: *See*—
Overbeek, Gerardus C.; and Huets, Martinus P. J., 4,983,662, Cl. 524-501.000.
Hughes Aircraft Company: *See*—
Alfing, Norman L., 4,983,237, Cl. 156-83.000.
Graybill, Mark; and Goetz, Allan, 4,984,187, Cl. 364-724.170.
Ho, Keese; Ferguson, Bruce R.; and Sandoval, Gregory J., 4,984,079, Cl. 358-160.000.
Maruko, Shuji U.; and Mulliner, Richard R., 4,982,487, Cl. 29-243.580.
Trout, Barry D., 4,984,253, Cl. 375-99.000.
Wreede, John E.; and Arns, James A., 4,983,003, Cl. 350-3.610.
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Humphrey, Patrick P. A.: *See*—
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Humplik, Antonin; Benckova, Maria; Caucik, Pavol; Durmis, Julius; Goghova, Marcela; Karvas, Milan; Orlik, Ivo; and Povazancova, Marta, to Vyskumny ustav chemickej technologie vyskumna a vyvojova organizacia. Synergistic mixture for polyolefin stabilization. 4,983,657, Cl. 524-120.000.
Hungerford, Charles S., Jr. Pipe clamp for connecting with a wooden joist or other frame member. 4,982,920, Cl. 248-71.000.
Hunsinger, Peter; and Zwarun, Andrew, to Propper Manufacturing Co., Inc. Manufacturing method for an occult fecal blood test slide. 4,983,416, Cl. 427-2.000.
Hunt, Charles V.: *See*—
Holtmyer, Marlin D.; Hunt, Charles V.; and Harms, Weldon M., 4,982,793, Cl. 166-305.100.
Hunt, Richard B.: *See*—
Eckler, Paul E.; and Hunt, Richard B., 4,983,798, Cl. 219-10.55M.
Hunt, William C., III; and Phelps, Craig H., to Mobil Oil Corporation. Method to reduce movement of a CPF device via a gelled petroleum based fluid. 4,982,790, Cl. 166-299.000.
Hunt, William C., III; and Phelps, Craig H., to Mobil Oil Corporation. Method to reduce movement of a CPF device via a drag-reducing fluid tamp. 4,982,791, Cl. 166-299.000.
Hunt, William C., III; and Phelps, Craig H., to Mobil Oil Corporation. Method to reduce movement of a CPF device via a shear-thickening fluid. 4,982,792, Cl. 166-299.000.
Hunter, Susan J., to Du Pont de Nemours, E. I., and Company. Surfaces for X-ray intensifying screens. 4,983,848, Cl. 250-483.100.
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., to Texas Instruments, Incorporated. Defect free trench isolation devices and method of fabrication. 4,983,226, Cl. 148-33.200.
Huntley, William P.; and Swanick, David J., to United States of America, Navy. Semi-automatic direction finding set. 4,983,983, Cl. 342-443.000.
Husky Injection Molding Systems Ltd.: *See*—
von Buren, Stefan; and Paulovic, Anton S., 4,983,117, Cl. 425-563.000.
Hussein, Mamoun M.; and Barcelon, Shirley A., to Warner-Lambert Company. Flavor enhancing and medicinal taste masking agent. 4,983,394, Cl. 424-440.000.
Hussey, Daniel J. Elevator safety barricade. 4,982,814, Cl. 182-230.000.
Huston, Steven W., to Rockwell International Corporation. Shock hazard warning device. 4,983,954, Cl. 340-657.000.
Hutchings, Graham J.: *See*—
Copperthwaite, Richard G.; Themistocleous, Themistoclis; and Hutchings, Graham J., 4,983,560, Cl. 502-85.000.
Huzino, Seizi; Mizuki, Shinya; Arai, Masumi; and Hattori, Tadashi, to Nippon Soken, Inc. Thin film electroluminescent element. 4,983,469, Cl. 428-690.000.
Hwang, Hak S., to Goldstar Co., Ltd. Cassette loading device for front loading VCR which utilizes the driving force of a capstan motor. 4,984,105, Cl. 360-85.000.
Hwang, Hyun-Ho. Prefabricated culvert system. 4,983,070, Cl. 405-124.000.
Hwang, Min-su. Noise-preventive means for compressor used in air conditioner. 4,982,812, Cl. 181-202.000.
Hydro International Limited: *See*—
Lamb, Timothy J., 4,983,294, Cl. 210-521.000.
Lamb, Timothy J.; and Smisson, Robert P. M., 4,983,295, Cl. 210-521.000.
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Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., to Hyundai Electronics Industries, Co., Ltd. Method for curing spin-on-glass film by utilizing ultraviolet irradiation. 4,983,546, Cl. 437-231.000.
Hyundai Electronics Industries, Co., Ltd.: *See*—
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.
I.Q.F. Inc.: *See*—
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I.R.T. Electronics Pty. Limited: *See*—
McKenzie, Hugh, 4,983,967, Cl. 341-110.000.
Ichiguchi, Tsuneo: *See*—
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Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, to Mitutoyo Corporation. Diffraction type optical encoder with improved detection signal insensitivity to optical grating gap variations. 4,983,825, Cl. 250-231.160.
Ichikawa, Takeshi: *See*—
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Ichikawa, Tetsuya: *See*—
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Ichimiya, Tuyoshi, to Kabushikikaisha Matumotoya Shokuhin. Beverage container with sipping tube. 4,982,854, Cl. 215-1.00A.
Ichimura, Takahiko, to Tomy Company, Ltd. Game with spinning tops. 4,982,961, Cl. 273-109.000.
Ichinokawa, Tatsuo: *See*—
Kawaguchi, Yasunobu; Muto, Toshiaki; and Ichinokawa, Tatsuo, 4,983,064, Cl. 403-30.000.
Ichinose, Isao: *See*—
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ICI Americas Inc.: *See*—
Gillis, Herbert R.; and Hannaby, Malcolm, 4,983,659, Cl. 524-186.000.
ICI Resins b.v.: *See*—
Overbeek, Gerardus C.; and Huets, Martinus P. J., 4,983,662, Cl. 524-501.000.
Ide, Akira: *See*—
Tateno, Minoru; and Ide, Akira, 4,984,207, Cl. 365-208.000.
Ide, Youji; and Kunitake, Tetsuji, to Ricoh Company, Ltd. Thermosensitive image transfer recording material. 4,983,444, Cl. 428-195.000.
Idemitsu Kosan Co., Ltd.: *See*—
Kaneko, Masato; Takagi, Minoru; Sunaga, Takashi; Komatsubara, Takeo; and Mutoh, Taira, 4,983,313, Cl. 252-68.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
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Identicator Corporation: *See*—
Arndt, Douglas C.; and Hedgcoth, Virgle L., 4,983,415, Cl. 427-1.000.
Ieki, Atushi: *See*—
Nashiki, Masayuki; Matsui, Keiji; and Ieki, Atushi, 4,983,900, Cl. 318-652.000.
Igarashi, Chikara: *See*—
Yusawa, Motoyasu; and Igarashi, Chikara, 4,983,742, Cl. 524-436.000.
Igarashi, Osamu; Shibata, Takanori; Matuoka, Yoji; Watanabe, Kazuhiro; and Terashima, Kunio, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co. Automotive information display device. 4,983,951, Cl. 340-461.000.
Igarashi, Sadao: *See*—
Ogata, Akimitsu; Fujisaka, Hisato; Igarashi, Sadao; Nozu, Toshimitsu; Onozato, Katsura; Hirose, Masanobu; and Miwa, Katsuji, 4,983,976, Cl. 342-42.000.
Igawa, Hiroyuki: *See*—
Nakamura, Satoshi; Simizu, Teruo; Naruse, Reizo; and Igawa, Hiroyuki, 4,983,876, Cl. 310-328.000.
Ige, Hitoshi: *See*—
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, 4,983,644, Cl. 522-14.000.
Iguchi, Kazuo: *See*—
Watanabe, Toshiaki; Iguchi, Kazuo; and Soejima, Tetsuo, 4,984,238, Cl. 370-105.100.
Iguchi, Yasuyuki: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 4,983,488, Cl. 430-137.000.
Iguchi, Yutaka: *See*—
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Iida, Tetsuya: *See*—
Iwamoto, Yoshihiro; and Iida, Tetsuya, 4,983,969, Cl. 341-118.000.
Iijima, Kenzaburou; Hayashi, Yoshinori; and Nishimura, Seiya, to Yamaha Corporation. Compact magnetic encoder. 4,983,916, Cl. 324-207.210.
Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Portable electronic device. 4,983,816, Cl. 235-379.000.
Iinuma, Hironobu: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,983,328, Cl. 260-404.500.
Ikawa, Kazuo: *See*—
Hirohata, Michio; Ikawa, Kazuo; and Ikuta, Kiyoshi, 4,983,998, Cl. 354-149.100.
Ikawa, Tatsuo: *See*—
Toda, Haruki; Ohshima, Shigeo; and Ikawa, Tatsuo, 4,984,216, Cl. 365-230.080.
Ikeda, Atsumi: *See*—
Saito, Yoshiomi; Fujino, Akio; and Ikeda, Atsumi, 4,983,678, Cl. 525-193.000.
Ikeda, Daishiro: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,983,328, Cl. 260-404.500.
Ikeda, Hayato: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Minami, Kenji; and Fukikawa, Iwao, 4,983,681, Cl. 525-290.000.
Ikeda, Minoru; Saito, Koichi; and Kobayashi, Hideki, to Kuraray Company, Ltd. Optical recording medium and recording process utilizing the same. 4,983,440, Cl. 428-64.000.
Ikeda, Mitsuhiro, to Mitsubishi Paper Mills Limited. Thermosensitive recording materials. 4,983,568, Cl. 503-208.000.
Ikeda, Takaharu: *See*—
Oda, Yoshiaki; Ikeda, Takaharu; and Yamachika, Hiroshi, 4,983,758, Cl. 560-105.000.
Ikeda, Takahide: *See*—
Saitoo, Ryuichi; Saitoo, Osamu; Ikeda, Takahide; Hirao, Mitsuru; and Hiraishi, Atsushi, 4,984,200, Cl. 365-154.000.
Ikeda, Yorinobu: *See*—
Ito, Toshiyuki; Ikeda, Yorinobu; Watanabe, Yasuhisa; and Tadenuma, Hiroshi, 4,983,656, Cl. 524-109.000.
Ikegaya, Kazutoshi; Sannomiya, Kunio; Tsuda, Yukifumi; Maruyama, Yuji; Araki, Nobuhiro; and Toba, Hiroto, to Matsushita Electric Industrial Co., Ltd. Linescan apparatus for detecting salient pattern of a product. 4,983,827, Cl. 250-235.000.
Ikemura, Masayuki; Karasaki, Takehiko; Inoue, Manabu; Katoh, Takehiro; Yamano, Yasuteru; and Hata, Koji, to Minolta Camera Kabushiki Kaisha. Brightness measuring apparatus for providing adequate object brightness and a flashlight emission apparatus providing adequate exposure, irrespective of photographing conditions. 4,984,006, Cl. 354-414.000.
Ikeno, Hidenori: *See*—
Kobayashi, Shunsuke; Ikeno, Hidenori; Maeda, Hiroki; Zhang, Bai Y.; and Yoshida, Masaaki, 4,984,198, Cl. 365-108.000.
Ikuhara, Hideyuki: *See*—
Miyoshi, Toshihiro; Kawashima, Masahiro; Ikuhara, Hideyuki; Kutsuki, Tetsuo; and Yamamoto, Kazuyasu, 4,984,081, Cl. 358-180.000.
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, to Olympus Optical Co., Ltd. Endoscope light source apparatus. 4,983,019, Cl. 350-313.000.
Ikuta, Fujiya: *See*—
Nakamura, Masayuki; and Ikuta, Fujiya, 4,984,195, Cl. 364-200.000.
Ikuta, Kiyoshi: *See*—
Hirohata, Michio; Ikawa, Kazuo; and Ikuta, Kiyoshi, 4,983,998, Cl. 354-149.100.
Illinois Institute of Technology: *See*—
Senkan, Selim M., 4,983,783, Cl. 585-641.000.
Imada, Eiji: *See*—
Katayama, Satoshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,983,741, Cl. 548-324.000.
Imai, Shin-ichi, to Kabushiki Kaisha Toshiba. Charge transfer device with booster circuit. 4,984,256, Cl. 377-60.000.
Imaizumi, Mamoru: *See*—
Mizuno, Toshiaki; Kimura, Shinji; Sugiura, Toshiaki; Sakuma, Mikio; Sugimoto, Tasuku; and Imaizumi, Mamoru, 4,983,854, Cl. 250-561.000.
Imam, Imdad; and Carlson, Gerald J., to General Electric Company. System for aligning a rotating line-shaft. 4,984,173, Cl. 364-508.000.
Imamura, Takashi: *See*—
Murata, Masakazu; Nagashima, Yoshinao; Hara, Kenji; Kayane, Shigeto; and Imamura, Takashi, 4,983,582, Cl. 514-23.000.
Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yanase, Yoshiyuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Twist drill. 4,983,079, Cl. 408-230.000.
Imperial Chemical Industries PLC: *See*—
Beck, Michael W.; and Kennedy, David L., 4,982,662, Cl. 102-205.000.
Denny, Patrick J.; and Carnell, Peter J. H., 4,983,365, Cl. 423-230.000.
Denny, Patrick J.; and Wood, Peter, 4,983,367, Cl. 423-244.000.
Imwinkelried, Rene; and Seebach, Dieter, 4,983,766, Cl. 562-470.000.
Improved Performance Systems, Inc.: *See*—
Athalye, Ravindra G., 4,983,952, Cl. 340-467.000.
Imwinkelried, Rene; and Seebach, Dieter, to Imperial Chemical Industries PLC. Optically active B hydroxy acids. 4,983,766, Cl. 562-470.000.
Inaba, Fumio. Spectroscopic apparatus for extremely faint light. 4,983,041, Cl. 356-346.000.
Inaba, Hiroshi: *See*—
Ishikawa, Masazumi; Osawa, Yasuhiko; Inaba, Hiroshi; Nakase, Kiyoshi; and Yanagida, Yukitoshi, 4,983,957, Cl. 340-785.000.
Inagaki, Jitsuo; Shimanishi, Asao; and Ono, Taisaburo. Sterilizing water-purifying reagent for drink. 4,983,286, Cl. 210-257.100.
Inami, Keiichi: *See*—
Tomioka, Atsuo; Harada, Hiroyuki; and Inami, Keiichi, 4,983,359, Cl. 422-81.000.
Inana, Katsuya: *See*—
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,084, Cl. 398-209.000.
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,090, Cl. 358-229.000.
Inaoka, Hideyuki: *See*—
Matsuhashi, Tomohiro; Kamata, Hideo; Yasuda, Masami; Kataoka, Satoshi; Inaoka, Hideyuki; and Watanabe, Eiichi, 4,984,281, Cl. 382-7.000.
Inax Corporation: *See*—
Matsumoto, Osamu, 4,982,453, Cl. 4-248.000.
Saito, Shiro; Kawamoto, Ryuichi; Kondo, Mineharu; and Sakakibara, Shigeru, 4,982,741, Cl. 128-771.000.
Industrial Technology Institute: *See*—
Harding, Kevin G., 4,983,043, Cl. 356-376.000.
Industrial Technology Research Institute: *See*—
Hong, Hei-Tai, 4,984,248, Cl. 375-7.000.
Tsai, Lii C., 4,983,483, Cl. 430-59.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Falconieri, Remo; and Uggetti, Sergio, 4,983,056, Cl. 400-208.000.
Ingemann, Ole, deceased (by Therkelsen, Ingrid, legal representative), to PLM AB. Method and apparatus for the closing of a container. 4,982,555, Cl. 53-405.000.
Innoland, Inc.: *See*—
Foley, Charles F., 4,982,968, Cl. 273-420.000.
Innova/Pure Water, Inc.: *See*—
Moeglich, Karl; and Pouli, Dirk, 4,983,267, Cl. 204-182.400.
Inoue, Akinari: *See*—
Nishikawa, Hiroshi; and Inoue, Akinari, 4,982,642, Cl. 84-484.000.

Inoue, Hajime: *See*—
Kanota, Keiji; Inoue, Hajime; and Seki, Takahito, 4,984,099, Cl. 360-46.000.
Inoue, Hitoshi: *See*—
Takahashi, Toshihisa; Uchinami, Masanobu; Nishida, Shinichi; and Inoue, Hitoshi, 4,982,714, Cl. 123-488.000.
Inoue, Kenji; Takahashi, Satomi; Yonetsu, Keiichi; and Ueyama, Noboru, to Kanegafuchi Chemical Industry Co., Ltd. Process for the production of 3,5,6-trihydroxyhexanoic acid derivative. 4,983,759, Cl. 500-174.000.
Inoue, Manabu: *See*—
Ikemura, Masayuki; Karasaki, Takehiko; Inoue, Manabu; Katoh, Takehiro; Yamano, Yasuteru; and Hata, Koji, 4,984,006, Cl. 354-414.000.
Inoue, Nobuaki; and Yoshida, Tetsuo, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,983,509, Cl. 430-627.000.
Inoue, Takao: *See*—
Matsuo, Takahiro; and Inoue, Takao, 4,983,335, Cl. 264-25.000.
Inoue, Yasuo: *See*—
Ishizu, Akira; Nishimura, Tadashi; and Inoue, Yasuo, 4,984,033, Cl. 357-17.000.
Inoue, Yoshihisa, to Nakamichi Corporation. Tape cartridge holder arrangement in a magnetic recording and reproducing device. 4,984,110, Cl. 360-95.000.
Inoue, Yoshio: *See*—
Sugino, Morihiko; and Inoue, Yoshio, 4,983,451, Cl. 422-283.000.
Instit National de Recherche sur les Transports et leur Securite: *See*—
Chollet, Hugues; Maupu, Jean-Louis; and Petit, Jean-Michel, 4,982,671, Cl. 105-168.000.
Institut Francais du Petrole: *See*—
Beauducel, Claude, 4,983,925, Cl. 328-151.000.
Beauducel, Claude; and Bolze, Etienne, 4,984,222, Cl. 367-159.000.
Born, Maurice; Parc, Guy; and Toulhoat, Herve , 4,983,558, Cl. 502-31.000.
Institut Straumann AG: *See*—
Steinemann, Samuel G., 4,983,184, Cl. 623-66.000.
Institute of Molecular Biology, Inc.: *See*—
Antoniades, Harry N.; and Lynch, Samuel E., 4,983,581, Cl. 514-12.000.
Instrumentarium Corp.: *See*—
Palonen, Juhani, 4,983,991, Cl. 346-33.0ME.
Intel Corporation: *See*—
Carrick, Paul, 4,983,958, Cl. 340-799.000.
Crowley, Richard N., 4,983,907, Cl. 324-158.00P.
Intepro, Inc.: *See*—
Butler, James R.; and Broederdorf, Roger L., 4,982,835, Cl. 198-836.300.
Inter-City Products Corp. (USA): *See*—
Lynch, Gregory A., 4,982,721, Cl. 126-116.00A.
Tomlinson, Ronald S., 4,982,785, Cl. 165-170.000.
Interco Tire Corporation: *See*—
Guidry, Warren L., 4,982,974, Cl. 280-164.200.
Interlock Structures International, Inc.: *See*—
Lange, Fredric A., 4,982,546, Cl. 52-648.000.
International Business Machines Corporation: *See*—
Black, Arthur G.; Mazzuca, John R.; Palmucci, Carl J.; and Rao, Surya K., 4,984,146, Cl. 363-44.000.
Casanova, Wayne J.; Reckinger, Arthur P., Jr.; Seyfert, Michael D.; Thorpe, James R.; and Wheeler, Stephen E., 4,984,133, Cl. 361-415.000.
Franaszek, Peter A., 4,984,237, Cl. 370-60.000.
Hiltebeitel, Nathan R.; Tamlyn, Robert; and Tomashot, Steven W., 4,984,214, Cl. 365-230.050.
Lu, Nicky C.; Machesney, Brian J.; Mohler, Rick L.; Miles, Glen L.; Ting, Chung-Yu; and Warley, Stephen D., 4,983,544, Cl. 437-200.000.
Parla, Anthony J.; and Tepper, Howard F., 4,982,892, Cl. 228-180.100.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; and McGhie, Joseph A., 4,983,579, Cl. 512-6.000.
International Fuel Cells Corporation: *See*—
Katz, Murray; Bonk, Stanley P.; Maricle, Donald L.; and Abrams, Martin, 4,983,472, Cl. 429-38.000.
International Multifoods Corporation: *See*—
Lund, Robert E., 4,983,343, Cl. 264-142.000.
International Paper Company: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,983,431, Cl. 428-34.200.
Interpet Ltd.: *See*—
Van Tulleken, Anthony; and Johnson, David, 4,983,813, Cl. 219-523.000.
Invictus, Inc.: *See*—
Schnell, William J., 4,983,178, Cl. 606-181.000.
Ire-Celltarg S.A.: *See*—
Herzog, Albert; Cravador, Alfredo; Houard, Sophie; and Bollen, Alex, 4,983,728, Cl. 536-27.000.
Irie, Akira; Kanaya, Yasuhiko; and Ohtani, Tamio, to Hitachi Seiko, Ltd. Printed circuit board adapter supplying apparatus and method for use in printed circuit board drilling apparatus. 4,982,831, Cl. 198-617.000.
Irie, Kazunori: *See*—
Nomura, Etsuzo; Takeuchi, Hirokasu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,982,677, Cl. 112-314.000.
Iriguchi, Jiro: *See*—
Yatagai, Hidetaka; Iriguchi, Jiro; Yamada, Souichi; and Takaya, Tsuguo, 4,983,710, Cl. 528-258.000.
Irihara, Kouichi: *See*—
Andou, Yukinori; Yui, Yuhi; and Irihara, Kouichi, 4,984,018, Cl. 355-200.000.
Irvine, John K.: *See*—
Milankov, Bosko; and Irvine, John K., 4,982,577, Cl. 62-381.000.
Irvine Sensors Corporation: *See*—
Go, Tiong C., 4,983,533, Cl. 437-7.000.
Isaka, Tsutomu: *See*—
Ishino, Iwao; Ohno, Akihiko; and Isaka, Tsutomu, 4,983,675, Cl. 525-100.000.
Isayama, Katsuhiko: *See*—
Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 4,983,700, Cl. 528-34.000.
Ishida, Hidetoshi: *See*—
Saito, Kazuhito; Kakii, Toshiaki; Ishida, Hidetoshi; and Suzuki, Shuzo, 4,983,012, Cl. 350-96.210.
Ishida, Koji: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.
Ishiguro, Shoji; and Morimoto, Kiyoshi, to Fuji Photo Film Co., Ltd. Method for manufacturing a light-sensitive silver halide emulsion. 4,983,508, Cl. 430-569.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,983,605, Cl. 514-247.000.
Tsujii, Tasuhiro; Isogai, Tatsuo; Awazu, Takao; and Kimura, Tokiya, 4,983,749, Cl. 558-88.000.
Ishii, Hidekazu: *See*—
Akiyama, Sigemi; and Ishii, Hidekazu, 4,983,057, Cl. 400-216.200.
Ishii, Kazuo: *See*—
Kato, Eiichi; and Ishii, Kazuo, 4,983,486, Cl. 430-115.000.
Ishii, Takahiko: *See*—
Uehara, Katsuhiro; Ishii, Takahiko; Fujikawa, Takao; Kanda, Kuniaki; and Narukawa, Yutaka, 4,983,112, Cl. 425-136.000.
Ishii, Yoshitaro: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.
Ishikawa, Jiro; Higuchi, Hirofumi; Ebata, Shuji; and Kida, Koichi, to Mitsubishi Gas Chemical Company, Inc. Process for production of carboxylic acid esters and formamide. 4,983,757, Cl. 560-103.000.
Ishikawa, Junichi: *See*—
Seike, Shoji; Oguri, Noriyasu; Harada, Hiroshi; and Ishikawa, Junichi, 4,983,556, Cl. 501-143.000.
Ishikawa, Keiichi: *See*—
Yoshino, Toshihiko; Funatsu, Koichi; and Ishikawa, Keiichi, 4,982,623, Cl. 74-866.000.
Ishikawa, Masao; Koboshi, Shigeharu; Kuse, Satoru; and Kurematsu, Masayuki, to Konica Corporation. Method for processing light-sensitive silver halide color photogrpahic material. 4,983,503, Cl. 430-393.000.
Ishikawa, Masazumi; Osawa, Yasuhiko; Inaba, Hiroshi; Nakase, Kiyoshi; and Yanagida, Yukitoshi. Electrochromic display device capable of display in plural colors. 4,983,957, Cl. 340-785.000.
Ishikawa, Osamu: *See*—
Tashiro, Takao; and Ishikawa, Osamu, 4,983,150, Cl. 475-85.000.
Ishikawa, Tsutomu, to Sanyo Electric Co., Ltd. Level determining circuit generating output signal at first or second output terminal according to level of input signal. 4,983,858, Cl. 307-362.000.
Ishino, Iwao; Ohno, Akihiko; and Isaka, Tsutomu, to Mitsubishi Petrochemical Co., Ltd. Crosslinked molded product. 4,983,675, Cl. 525-100.000.
Ishitani, Tohru: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.
Ishizaka, Akitoshi: *See*—
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, 4,984,048, Cl. 357-34.000.
Ishizu, Akira; Nishimura, Tadashi; and Inoue, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Thin film semiconductor device with oxide film on insulating layer. 4,984,033, Cl. 357-17.000.
Ismail, Roshdy. Anti-rheumatic agents and their use. 4,983,626, Cl. 514-458.000.
Isobe, Takayuki: *See*—
Yamagishi, Hirofumi; Ohtsuka, Shigenobu; Kikuchi, Youichi; Isobe, Takayuki; and Mochizuki, Masato, 4,984,136, Cl. 362-66.000.
Isobe, Tami, to Ricoh Company Ltd. Method for determining incident angle in measurement of refractive index and thickness. 4,983,823, Cl. 250-225.000.
Isogai, Tatsuo: *See*—
Tsujii, Tasuhiro; Isogai, Tatsuo; Awazu, Takao; and Kimura, Tokiya, 4,983,749, Cl. 558-88.000.
Isotec AG: *See*—
Mayring, Arnold, 4,983,882, Cl. 315-59.000.
Isoworth Limited: *See*—
Scott, Alistair, 4,982,876, Cl. 222-153.000.

Isozaki, Jun: *See*—
Takayama, Norikazu; Ushijima, Nobuyoshi; Kobashi, Tetsuzo; Sato, Masahiko; Yano, Yoshihiko; Isozaki, Jun; Fujii, Kousuke; and Kudoh, Yoshinobu, 4,984,100, Cl. 360-49.000.

Isuzu Motors Limited: *See*—
Ohasi, Tamiyosi; Mizuno, Masami; Aoki, Tomohide; and Hokari, Osamu, 4,982,757, Cl. 137-202.000.

Italimpianti S.p.A.: *See*—
Bonino, Stefano F. S.; and Cavero, Nicola B., 4,982,934, Cl. 266-105.000.

Ito, Hiroaki: *See*—
Miyake, Haruhisa; Ito, Hiroaki; Suzuki, Koji; and Yamada, Ryoji, 4,983,264, Cl. 204-98.000.

Ito, Koichi: *See*—
Takahashi, Toshihiro; Ito, Koichi; and Tobita, Hideyuki, 4,982,468, Cl. 8-159.000.

Ito, Toshiyuki; Ikeda, Yorinobu; Watanabe, Yasuhisa; and Tadenuma, Hiroshi, to Japan Synthetic Rubber Co., Ltd. Aqueous pressure-sensitive adhesive. 4,983,656, Cl. 524-109.000.

Itoh, Fumikazu: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.

Itoh, Hiroshi: *See*—
Takada, Mitsuru; Itoh, Hiroshi; Takahashi, Tokuyuki; and Funahashi, Makoto, 4,982,624, Cl. 74-869.000.

Itoh, Hirosumi: *See*—
Nomura, Etsuzo; Takeuchi, Hirokasu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,982,677, Cl. 112-314.000.

Itoh, Kiyoo: *See*—
Kawahara, Takayuki; Kitsukawa, Goro; Kawajiri, Yoshiki; and Itoh, Kiyoo, 4,984,202, Cl. 365-177.000.

Itoh, Teruaki. Automatic test tube plug extraction apparatus. 4,982,553, Cl. 53-246.000.

Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Nishino, Hiroyuki; and Sakaguchi, Jun, to Hokuriku Pharmaceutical Co., Ltd. Amide compounds, process for preparing the same, and composition for activating gastric motor function containing the same. 4,983,633, Cl. 514-622.000.

Itou, Masaaki; and Moriyama, Shigeo, to Hitachi, Ltd. X-ray exposure apparatus. 4,984,259, Cl. 378-146.000.

Iversen, Arthur H., to Coriolis Corporation. Cooling of large semi-conductor devices. 4,984,066, Cl. 357-82.000.

Ivy Hill Corporation: *See*—
Friedman, Herbert, 4,982,846, Cl. 206-621.300.

Iwahashi, Hiroshi: *See*—
Kikuchi, Shinichi; Iwahashi, Hiroshi; Kato, Hideo; and Sato, Isao, 4,983,861, Cl. 307-443.000.

Iwahashi, Koji, to NEC Corporation. Battery charger for vehicle-mounted equipment using engine operation as start timing determination. 4,983,904, Cl. 320-15.000.

Iwai, Masakazu: *See*—
Fukaya, Chikara; Yasuda, Hitoshi; Akira, Toshiaki; Iwai, Masakazu; Okano, Kanemichi; and Yokoyama, Kazumasa, 4,983,584, Cl. 514-54.000.

Iwai, Tohru: *See*—
Shibano, Yoshizo; Suzuki, Haruo; and Iwai, Tohru, 4,983,984, Cl. 343-711.000.

Iwamoto, Yoshihiro; and Iida, Tetsuya, to Kabushiki Kaisha Toshiba. Successive approximation analog to digital converter. 4,983,969, Cl. 341-118.000.

Iwamura, Masahiro: *See*—
Suzuki, Yukio; Masuda, Ikuro; Iwamura, Masahiro; Kadono, Shinji; Uragami, Akira; Yoshimura, Masayoshi; and Matsubara, Toshiaki, 4,983,862, Cl. 307-446.000.

Iwasaki, Hitochi: *See*—
Yoshida, Tomohiko; Handa, Ryoji; Tajiri, Noriyuki; Iwasaki, Hitochi; and Yoshihiro, Mituto, 4,983,660, Cl. 524-369.000.

Iwasaki, Katsunori: *See*—
Endoh, Minoru; Nozawa, Yasuto; Iwasaki, Katsunori; Tanigawa, Shigeho; and Tokunaga, Masaaki, 4,983,232, Cl. 148-302.000.

Iwasaki, Koji, to Seiko Instruments Inc. Focused ion beam apparatus having charged particle energy filter. 4,983,830, Cl. 250-309.000.

Iwasaki, Toshiaki: *See*—
Morii, Satoshi; Mitsui, Hiroyuki; and Iwasaki, Toshiaki, 4,982,676, Cl. 112-121.150.

Iwase, Mikio: *See*—
Yamamoto, Masanari; Iwase, Mikio; and Tomino, Toshihiro, 4,982,622, Cl. 74-866.000.

Iwase, Osamu: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Oosumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.

Iwashita, Takashi; Awazu, Koichi; and Murase, Kiyoshi, to Kabushiki Kaisha Toshiba. Memory access control apparatus. 4,984,149, Cl. 364-200.000.

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Loser, Hans; Chau-Huu, Tri; and Meinecke, Albrecht, 4,982,513, Cl. 34-116.000.

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Kille, Ewald; and Griebel, Heinrich, 4,982,899, Cl. 239-329.000.

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Sakamoto, Masafumi, 4,983,867, Cl. 310-49.00R.

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Ito, Toshiyuki; Ikeda, Yorinobu; Watanabe, Yasuhisa; and Tadenuma, Hiroshi, 4,983,656, Cl. 524-109.000.

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Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,983,847, Cl. 250-483.100.

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Shah, Nyan S., 4,982,747, Cl. 132-75.500.

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Hahn, Dennis; Johansson, Gary A.; Ruscio, Dominic V.; and Blank, Christopher E., 4,983,332, Cl. 264-1.100.

John, Thomas: *See—*
Hamm, Anton; and John, Thomas, 4,982,660, Cl. 101-350.000.

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Ward, Terence J.; White, Janet C.; and Bradley, Gerald, 4,983,600, Cl. 514-214.000.

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Moll, Norman G.; and Johnson, David R., 4,983,640, Cl. 521-60.000.

Johnson, Donald S.: *See—*
Gross, David C.; Johnson, Donald S.; and Shannon, Connie H., 4,983,641, Cl. 521-82.000.

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Lok, King K., 4,983,866, Cl. 310-43.000.
Strobl, Georg, 4,983,871, Cl. 310-234.000.
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Erb, Roger; Johnson, Robert; and Smith, Richard, 4,983,203, Cl. 65-265.000.

Johnston, Charles J.: *See—*
Swart, Mark A.; and Johnston, Charles J., 4,983,909, Cl. 324-158.00P.

Johnston, Earl S., to Challenger Electrical Materials, Inc. Electrical wiring box with structure for fast device mounting. 4,983,785, Cl. 174-53.000.

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Rock, Erich, 4,983,000, Cl. 312-333.000.

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Jurkiewicz, James S.: *See—*
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McClenny, Ronnie G., 4,982,512, Cl. 34-77.000.

Jyoraku, Fumio: *See—*
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.

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Kabashima, Kazuo: *See—*
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,983,569, Cl. 503-217.000.

Kabelitz, Hans-Peter: *See—*
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Kabeya, Noriaki: *See—*
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Kabushiki Kaisha Daikin Seisakusho: *See—*
Fukatani, Yasunobu, 4,982,824, Cl. 192-85.0AB.
Koshimo, Masahiko, 4,982,819, Cl. 188-296.000.
Tanaka, Teruhiko, 4,982,821, Cl. 192-3.290.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Sugino, Morihiko; and Inoue, Yoshio, 4,983,451, Cl. 422-283.000.
Uehara, Katsuhiro; Ishii, Takahiko; Fujikawa, Takao; Kanda, Kuniaki; and Narukawa, Yutaka, 4,983,112, Cl. 425-136.000.

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Arakawa, Shuji; and Mimura, Tatsuo, 4,984,289, Cl. 405-184.000.

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Nashiki, Masayuki; Matsui, Keiji; and Ieki, Atushi, 4,983,900, Cl. 318-652.000.

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Takahashi, Mitsuharu, 4,982,887, Cl. 226-24.000.

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Kokubu, Sadao, 4,983,794, Cl. 200-461.000.
Suzuki, Masaru, 4,983,795, Cl. 200-550.000.

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Nishimura, Yuji, 4,982,982, Cl. 280-808.000.

Kabushiki Kaisha Toshiba: *See—*
Ando, Hideo, 4,984,225, Cl. 369-13.000.
Hagiuda, Akiko; and Kawakatsu, Akira, 4,983,001, Cl. 350-1.600.
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Iwamoto, Yoshihiro; and Iida, Tetsuya, 4,983,969, Cl. 341-118.000.
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Matsumoto, Hiroshi, 4,984,061, Cl. 357-68.000.
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Tanaka, Seiichi; and Kurihara, Kouichi, 4,984,070, Cl. 358-36.000.
Toda, Haruki; Ohshima, Shigeo; and Ikawa, Tatsuo, 4,984,216, Cl. 365-230.080.
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Kabushiki Kaisha Yokota: *See—*
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Kadono, Shinji: *See—*
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Kaelin, Daniel P.: *See—*
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Kageyama, Yukihiko: *See—*
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Kaiser, Richard A. Buffing pad cleaning method and apparatus. 4,983,221, Cl. 134-6.000.

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Okazaki, Susumu; Yamamoto, Takeshi; Kajimoto, Shinshi; Konishi, Takeshi; Hisanaga, Naogi; and Tanaka, Takahiko, 4,982,993, Cl. 296-192.000.

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Kaken Pharmaceutical Co. Ltd.: *See*—
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Kakii, Toshiaki: *See*—
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Schon, Uwe; Kehrbach, Wolfgang; and Wolf, Klaus-Ullrich, 4,983,611, Cl. 514-300.000.

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Kamatics Corporation: *See*—
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Kamishita, Takuzo; Miyazaki, Takashi; and Okuno, Yoshihide, to Toko Yakuhin Kogyo Kabushiki Kaisha. Method for inhibiting the decrease in viscosity of gel ointment base and ointment. 4,983,386, Cl. 424-78.000.

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Kamiyama, Kenzo: *See*—
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Kanai, Toshio: *See*—
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Kanamaru, Hiroyuki: *See*—
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Kanari, Mɔtsukichi: *See*—
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Kanatani, Yoshiharu: *See*—
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Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, to Mazda Motor Corporation; and Nippon Seiko Kabushiki Kaisha. Vehicle steering system. 4,982,804, Cl. 180-140.000.

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Kanebo Ltd.: *See*—
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Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 4,983,700, Cl. 528-34.000.

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Asanuma, Masato; Kaneshige, Masatoshi; and Aimoto, Toyoka, 4,982,691, Cl. 118-658.000.

Kanno, Masahide: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.

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Kansai Paint Co., Ltd.: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Oosumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.
Kikuta, Makoto; and Terasawa, Hideo, 4,983,270, Cl. 204-299.0EC.

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Kao Corporation: *See*—
Murata, Masakazu; Nagashima, Yoshinao; Hara, Kenji; Kayane, Shigeto; and Imamura, Takashi, 4,983,582, Cl. 514-23.000.

Kaptsevich, Vyacheslav M.: *See*—
Stepanenko, Alexandr V.; Vereschagin, Mikhail N.; Paly, Oleg I.; Sheleg, Valery K.; Kaptsevich, Vyacheslav M.; Gorunov, Valery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V., 4,982,780, Cl. 164-463.000.

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Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, 4,983,764, Cl. 562-17.000.

Karageorgiou, Theodore G., to BASF Corporation. Polyamide filaments having improved properties and method of preparation. 4,983,448, Cl. 428-224.000.

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Ikemura, Masayuki; Karasaki, Takehiko; Inoue, Manabu; Katoh, Takehiro; Yamano, Yasuteru; and Hata, Koji, 4,984,006, Cl. 354-414.000.

Karbachsch, Massoud; and Pett, Manfred, to Seitz-Filter-Werke Theo & Geo Seitz GmbH und Co. Filter element with membrane-type filter material. 4,983,288, Cl. 210-321.870.

Karl, Rudolf: *See*—
Speakman, John-Bryan; Karl, Rudolf; Lorenz, Gisela; Ammermann, Eberhard; Wuerzer, Bruno; Meyer, Norbert; and Ditrich, Klaus, 4,983,587, Cl. 514-63.000.

Karlsson, Karl O.; Westerlund, Alf T.; and Fransson, Gunnar S., to Telefonaktiebolaget L M Ericsson. Contact member. 4,983,129, Cl. 439-395.000.

Karol, Frederick J.: *See*—
Schramm, Kathleen D.; and Karol, Frederick J., 4,983,562, Cl. 502-112.000.

Karube, Norio, to Fanuc, Ltd. Laser oscillator device and method of filling laser gas in such laser oscillator device. 4,984,245, Cl. 372-59.000.

Karvas, Milan: *See*—
Humplik, Antonin; Benckova, Maria; Caucik, Pavol; Durmis, Julius; Goghova, Marcela; Karvas, Milan; Orlik, Ivo; and Povazancova, Marta, 4,983,657, Cl. 524-120.000.

Kasai, Kazumi, to Yoshida Kogyo, K.K. Pair of snappingly engageable members. 4,982,480, Cl. 24-575.000.

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Kashida, Meguru: *See*—
Hara, Yasuaki; Ogawa, Masahiko; and Kashida, Meguru, 4,983,701, Cl. 528-15.000.

Kashihara, Akio: *See*—
Numata, Syuhei; Ohiwa, Masanori; Maekawa, Toshihiro; Kashihara, Akio; and Miyazono, Tadafumi, 4,983,671, Cl. 525-63.000.

Kashimoto, Kazuhiro: *See*—
Tsukakoshi, Osamu; Sakurada, Yuzo; and Kashimoto, Kazuhiro, 4,983,850, Cl. 250-492.300.

Kashio, Jiro: *See*—
Nakayashiki, Susumu; Kashio, Jiro; Matsumura, Hisashi; Wada, Hiroyuki; Sako, Yoshihito; Matsuura, Fumiaki; and Kajiya, Ihei, 4,984,233, Cl. 370-16.000.

Kashiwagi, Hiroshi: *See*—
Tamura, Koji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 4,983,312, Cl. 252-67.000.

Kashiwara, Hideaki: *See*—
Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki, 4,983,877, Cl. 313-140.000.

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Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki, 4,983,877, Cl. 313-140.000.

Katagase, Yasuhide: *See*—
Sano, Yoshiaki; Hanazawa, Toshio; Katagase, Yasuhide; Yasukouchi, Katsuyuki; Matsumoto, Takashi; and Fujihara, Susumu, 4,983,905, Cl. 323-274.000.

Katahira, Kiyoshi: *See*—
Nakazawa, Takeshi; Hashimoto, Jun; Nakamura, Shinichi; Yamazaki, Katsumi; Nakajima, Yoshihiro; Hayashi, Tsutomu; Ichikawa, Tetsuya; Yakigaya, Nobuyuki; Katahira, Kiyoshi; and Takeshima, Yoshinobu, 4,984,161, Cl. 364-424.100.

Kataoka, Satoshi: *See*—
Matsuhashi, Tomohiro; Kamata, Hideo; Yasuda, Masami; Kataoka, Satoshi; Inaoka, Hideyuki; and Watanabe, Eiichi, 4,984,281, Cl. 382-7.000.

Katayama, Katsuhiro: *See*—
Kuriowa, Katsumasa; Katayama, Katsuhiro; and Nagasawa, Takeshi, 4,983,756, Cl. 560-56.000.

Katayama, Satoshi; Imada, Eiji; and Tsuchimoto, Shuhei, to Sharp Kabushiki Kaisha. 1,2,4,5-benzoylenebis(naphtho[2,3-d]imidazole) compounds and photosensitive members containing them. 4,983,741, Cl. 548-324.000.

Katayama, Yasunori: *See*—
Masaki, Ryoso; Kayama, Masahiro; Hayashida, Hiroshi; Nihei, Hideki; Katayama, Yasunori; Nagase, Hiroshi; Matsuda, Toshihiko; and Kamiyama, Kenzo, 4,983,875, Cl. 310-323.000.

Katayama, Yasuyuki: *See*—
Sugiyama, Kenji; Katayama, Yasuyuki; Suzuki, Nobuyuki; Uchida, Tomoaki; and Kouguchi, Tatsushi, 4,984,068, Cl. 358-31.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Liquid developers for electrophotography. 4,983,486, Cl. 430-115.000.

Kato, Haruo, to Kabushiki Kaisha Toshiba. Digital signal processing device for calculating real and imaginary parts of an input signal. 4,984,188, Cl. 364-725.000.

Kato, Haruo: *See*—
Okamoto, Masamitsu; Wada, Masami; Funikawa, Hidenori; Kato, Haruo; and Shouji, Hideaki, 4,982,495, Cl. 29-846.000.

Kato, Hideo: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Nishino, Hiroyuki; and Sakaguchi, Jun, 4,983,633, Cl. 514-622.000.
Kikuchi, Shinichi; Iwahashi, Hiroshi; Kato, Hideo; and Sato, Isao, 4,983,861, Cl. 307-443.000.

Kato, Masatoshi: *See*—
Kitaguchi, Hiroshi; and Kato, Masatoshi, 4,983,494, Cl. 430-203.000.

Kato, Nobuhide; and Katsu, Masanori, to NGK Insulators, Ltd. Oxygen sensor. 4,983,271, Cl. 204-426.000.

Kato, Nobuhisa; and Moriguchi, Fujio, to Fuji Xerox Co., Ltd. Halftone image gradation data converted to bit-train data with data retained after thresholding converted to pulse-train data. 4,984,092, Cl. 358-298.000.

Kato, Tomohiro: *See*—
Kinoshita, Tsukasa; and Kato, Tomohiro, 4,983,309, Cl. 252-8.600.

Katoh, Shinichi: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.

Katoh, Takehiro: *See*—
Ikemura, Masayuki; Karasaki, Takehiko; Inoue, Manabu; Katoh, Takehiro; Yamano, Yasuteru; and Hata, Koji, 4,984,006, Cl. 354-414.000.

Katoh, Tokunori: *See*—
Makino, Kazumasa; Yoshihara, Hideo; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takeshi; Katoh, Tokunori; Morisaki, Hiroshi; Kobayashi, Masanari; and Asai, Shin, 4,984,009, Cl. 355-27.000.
Sakakibara, Kenji; Akao, Michitoshi; Katoh, Tokunori; and Sawaki, Yukichi, 4,984,011, Cl. 355-27.000.

Katokichi Co., Ltd.: *See*—
Tsugita, Takashi; Takeuchi, Shinya; Doi, Koichi; and Kishimoto, Fumito, 4,983,304, Cl. 210-640.000.

Katori, Shigetatsu; Maehashi, Yukio; and Misawa, Yukari, to NEC Corporation. Serial data transfer system. 4,984,190, Cl. 364-900.000.

Katsu, Masanori: *See*—
Kato, Nobuhide; and Katsu, Masanori, 4,983,271, Cl. 204-426.000.

Katsube, Yasuhiro, to Kabushiki Kaisha Toshiba. Call admission control method and cell flow monitoring method in the same method. 4,984,264, Cl. 379-197.000.

Katz, Murray; Bonk, Stanley P.; Maricle, Donald L.; and Abrams, Martin, to International Fuel Cells Corporation. Fuel cell current collector. 4,983,472, Cl. 429-38.000.

Kaufmann, Hans; Kueng, Roland; Grob, Urs; and Welti, Arnold, to Ascom Zelcom AG. Digital radio transmission system for a cellular network, using the spread spectrum method. 4,984,247, Cl. 375-1.000.

Kautek, Wolfgang: *See*—
Henkel, Hans-Joachim; Markert, Helmut; Roth, Wolfgang; and Kautek, Wolfgang, 4,983,419, Cl. 427-53.100.

Kauth, Heremann: *See*—
Kress, Hans-Jurgen; Kauth, Heremann; Peters, Horst; Lindner, Christian; and Muller, Friedemann, 4,983,658, Cl. 524-141.000.

Kawaguchi, Hideo: *See*—
Takayanagi, Takashi; and Kawaguchi, Hideo, 4,983,429, Cl. 428-001.000.

Kawaguchi, Katsumi: *See*—
Tanaka, Yoshio; and Kawaguchi, Katsumi, 4,983,411, Cl. 426-234.000.

Kawaguchi, Susumu; Shirafuji, Yoshinori; Maeyama, Hideaki; Sugita, Tatsuya; and Yamamoto, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Low pressure container type rolling piston compressor with lubrication channel in the end plate. 4,983,108, Cl. 418-63.000.

Kawaguchi, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Shadow mask type color cathode ray tube with shadow mask effective to minimize the appearance of Moire patterns. 4,983,879, Cl. 313-402.000.

Kawaguchi, Yasunobu; Muto, Toshiaki; and Ichinokawa, Tatsuo, to Honda Giken Kogyo Kabushiki Kaisha. Metal ceramic fitting assembly. 4,983,064, Cl. 403-30.000.

Kawahara, Takayuki; Kitsukawa, Goro; Kawajiri, Yoshiki; and Itoh, Kiyoo, to Hitachi, Ltd. Low voltage-operated semiconductor integrated circuit. 4,984,202, Cl. 365-177.000.

Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, to Hirose Electric Co., Ltd. Electrical connector. 4,983,127, Cl. 439-79.000.

Kawai, Taiyo: *See*—
Takeda, Keiso; Kawai, Taiyo; Nakanishi, Kiyoshi; Ujihashi, Michiaki; and Takano, Yuichi, 4,982,716, Cl. 123-531.000.

Kawai, Tatsuya; Matsuda, Takashi; and Yoshimoto, Michiaki, to Japan Medical Supply Co., Ltd. Coated sutures exhibiting improved knot security. 4,983,180, Cl. 606-230.000.

Kawajiri, Yoshiki: *See*—
Kawahara, Takayuki; Kitsukawa, Goro; Kawajiri, Yoshiki; and Itoh, Kiyoo, 4,984,202, Cl. 365-177.000.

Kawakatsu, Akira: *See*—
Hagiuda, Akiko; and Kawakatsu, Akira, 4,983,001, Cl. 350-1.600.

Kawamata, Syooichi: *See*—
Miyashita, Kunio; Hayashida, Hiroshi; Takahashi, Tadashi; and Kawamata, Syooichi, 4,983,893, Cl. 318-135.000.

Kawamoto, Isao: *See*—
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.

Kawamoto, Ryuichi: *See*—
Saito, Shiro; Kawamoto, Ryuichi; Kondo, Mineharu; and Sakakibara, Shigeru, 4,982,741, Cl. 128-771.000.

Kawamoto, Yoshifumi: *See*—
Sunami, Hideo; Kure, Tokuo; Kawamoto, Yoshifumi; Tamura, Masao; and Miyao, Masanobu, 4,984,030, Cl. 357-23.600.

Kawamura, Ikunosuke: *See*—
Yonemasu, Hiro; Shirai, Kiyohide; and Kawamura, Ikunosuke, 4,982,494, Cl. 29-827.000.

Kawamura, Katsumi: *See*—
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,984,115, Cl. 360-106.000.

Kawano, Minoru: *See*—
Yokota, Chitoshi; Kawano, Minoru; Sueyoshi, Masahiko; Nishida, Toshiro; Setoguchi, Shohachi; and Fujimoto, Akira, 4,982,984, Cl. 292-201.000.

Kawasaki, Akira, to Nissan Motor Co., Ltd. Rear suspension system. 4,982,978, Cl. 280-675.000.

Kawasaki, Nozomu: *See*—
Higgins, Larry; Scott, Terence A.; and Kawasaki, Nozomu, 4,982,466, Cl. 5-453.000.

Kawasaki Steel Corp: *See*—
Nishiwaki, Hiroshi, 4,982,469, Cl. 15-3.000.

Kawashima, Masahiro: *See*—
Miyoshi, Toshihiro; Kawashima, Masahiro; Ikuhara, Hideyuki; Kutsuki, Tetsuo; and Yamamoto, Kazuyasu, 4,984,081, Cl. 358-180.000.

Kayama, Masahiro: *See*—
Masaki, Ryoso; Kayama, Masahiro; Hayashida, Hiroshi; Nihei, Hideki; Katayama, Yasunori; Nagase, Hiroshi; Matsuda, Toshihiko; and Kamiyama, Kenzo, 4,983,875, Cl. 310-323.000.

Kayane, Shigeto: *See*—
Murata, Masakazu; Nagashima, Yoshinao; Hara, Kenji; Kayane, Shigeto; and Imamura, Takashi, 4,983,582, Cl. 514-23.000.

Kayanuma, Akio, to Sony Corporation. Bipolar transistor with reduced parasitic capacitance. 4,984,053, Cl. 357-50.000.

Kaye, Arthur, to British Aerospace Public Limited Company. Force sensitive aircraft throttle with feedback. 4,982,918, Cl. 244-223.000.

Kayos, Csaba: *See*—
Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, 4,983,764, Cl. 562-17.000.

Kazami, Kazuyuki; Nakamura, Toshiyuki; and Wakabayashi, Hiroshi, to Nikon Corporation. Photographing mode switching device of a camera. 4,984,005, Cl. 354-412.000.

Kazmierczak, Frederick F.: *See*—
Ullal, Pramode N.; and Kazmierczak, Frederick F., 4,982,883, Cl. 224-209.000.

Kazmierczak, Robert T.; and Mac Leay, Ronald E., to Atochem North America, Inc. Reactive hindered amine light stabilizers. 4,983,738, Cl. 546-208.000.

Keenan, James J.: *See*—
Ham, Howard M., Jr.; and Keenan, James J., 4,983,955, Cl. 340-664.000.

Keezer, William J.: *See*—
Aylward, J. Richard; Holl, Timothy; and Keezer, William J., 4,984,273, Cl. 381-1.000.

Kehrbach, Wolfgang: *See*—
Schon, Uwe; Kehrbach, Wolfgang; and Wolf, Klaus-Ullrich, 4,983,611, Cl. 514-300.000.

Keiper Recaro GmbH & Co.: *See*—
Becker, Karin; Braun, Dieter; and Edel, Gerd, 4,983,066, Cl. 403-274.000.

Keiser, Robert J.: *See*—
Ruckle, Duane L.; Strangman, Thomas E.; and Keiser, Robert J., 4,982,893, Cl. 228-220.000.

Kelley, Robert G.; VanAusdal, R. Phillip; and Wadium, Christopher S., to Stone Container Corporation. Two-stage auger system for filling commercial valve bags. 4,982,873, Cl. 222-77.000.

Kelsey-Hayes Company: *See*—
Kengle, George, 4,983,805, Cl. 219-101.000.

Kelsey, Randy J.: *See*—
Grone, Donald J.; and Kelsey, Randy J., 4,983,966, Cl. 341-84.000.

Kendall Company, The: *See*—
Etheredge, Robert W., III.; and Charkoudian, John C., 4,983,170, Cl. 604-270.000.
Patience, Donald; and Li, Felipe S., 4,983,173, Cl. 604-384.000.

Kengle, George, to Kelsey-Hayes Company. Flashless D.C. butt welding electrodes. 4,983,805, Cl. 219-101.000.

Kennedy, Clinton R.; Shih, Stuart S.; and Ware, Robert A., to Mobil Oil Corporation. Hydrocracking process with partial liquid recycle. 4,983,273, Cl. 208-89.000.

Kennedy, David L.: *See*—
Beck, Michael W.; and Kennedy, David L., 4,982,662, Cl. 102-205.000.

Keren-Zvi, Joseph; and King, Wayne M., to Codex Corporation. Distributed switching architecture for communication module redundancy. 4,984,240, Cl. 371-8.200.

Kervagoret, Gilbert, to Bendix Europe Services Techniques. Modulator and power-assisted steering circuit comprising such a modulator. 4,982,803, Cl. 180-132.000.

Kessler, Jack: *See*—
Li, May K.; McLaughlin, Donna; Palome, Elaine; and Kessler, Jack, 4,983,523, Cl. 435-173.000.

Kessler, Siegfried: *See*—
Bisping, Bernhard; Vagedes, Michael; and Kessler, Siegfried, 4,982,669, Cl. 102-520.000.

Ketchum, Susan K.: *See*—
Stewart, James L.; Ketchum, Susan K.; and Stumpf, Robert J., 4,983,529, Cl. 436-512.000.

Ketterer, Gunter: *See*—
Nolke, Gunter; Ketterer, Gunter; and Dyma, Horst, 4,984,117, Cl. 360-124.000.

Key Pharmaceuticals, Inc.: *See*—
Bodor, Nicholas; and Loftsson, Thorsteinn, 4,983,396, Cl. 424-449.000.

Keyes, George B.: *See*—
Cashman, Donald; Ferguson, John A.; and Keyes, George B., 4,983,578, Cl. 512-3.000.
Requejo, Luz P.; and Keyes, George B., 4,983,317, Cl. 252-174.240.

Keystone International Inc.: *See*—
Roush, Walter T., 4,982,483, Cl. 29-213.100.

Kholomeev, Alexandr V.: *See*—
Stepanenko, Alexandr V.; Vereschagin, Mikhail N.; Paly, Oleg I.; Sheleg, Valery K.; Kaptsevich, Vyacheslav M.; Gorunov, Valery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V., 4,982,780, Cl. 164-463.000.

Kiapokas, Michael G.: *See*—
Strong, Michael D.; Zimmerman, Charles E.; and Kiapokas, Michael G., 4,982,830, Cl. 198-349.600.

Kicks, Malcolm, to Larrett Tungsten Dart Company LTD. Dartboards. 4,982,967, Cl. 273-408.000.

Kida, Koichi: *See*—
Ishikawa, Jiro; Higuchi, Hirofumi; Ebata, Shuji; and Kida, Koichi, 4,983,757, Cl. 560-103.000.

Kidawara, Atsushi: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.

Kidney, Paul D.; Rowlands, Andrew S.; and Mills, William P., to Emyville Enterprises Limited. Image processing and map production systems. 4,984,279, Cl. 382-1.000.

Kiecker, Manfred; Torke, Dieter; and Lange, Ludwig, to Degussa Aktiengesellschaft. Gastight container for warm storage and transport. 4,982,871, Cl. 220-426.000.

Kihara, Toshimasa: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,984,212, Cl. 365-230.030.

Kijima, Naoto; and Oguri, Yasuo, to Mitsubishi Kasei Corporation. Ceramic implant and process for its production. 4,983,182, Cl. 623-16.000.

Kikuchi, Hiroshi: *See*—
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, 4,983,725, Cl. 536-4.100.

Kikuchi, Masahiro: *See*—
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,983,605, Cl. 514-247.000.

Kikuchi, Shinichi; Iwahashi, Hiroshi; Kato, Hideo; and Sato, Isao, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit with an input buffer circuit for preventing false operation caused by power noise. 4,983,861, Cl. 307-443.000.

Kikuchi, Youichi: *See*—
Yamagishi, Hirofumi; Ohtsuka, Shigenobu; Kikuchi, Youichi; Isobe, Takayuki; and Mochizuki, Masato, 4,984,136, Cl. 362-66.000.

Kikuta, Kuniko, to NEC Corporation. Semiconductor device and method of manufacturing the same. 4,983,534, Cl. 437-31.000.

Kikuta, Makoto; and Terasawa, Hideo, to Kansai Paint Co., Ltd. Device for controlling the amount of a solid paint component in electrodeposition coating. 4,983,270, Cl. 204-299.0EC.

Kille, Ewald; and Griebel, Heinrich, to J. Wagner, GmbH. Device for regulating discharge volumes of a nozzle. 4,982,899, Cl. 239-329.000.

Killingstad, Tore. Arrangement in a door hinge with two hinge flaps and an attaching plate for one of said hinge flaps. 4,982,475, Cl. 16-257.000.

Kim, Bang M., to General Electric Company. Method for producing resin rich surface layer on composite thermoplastic material. 4,983,247, Cl. 156-272.200.

Kim, Byung C.; and Ryu, Dewey D. Y., to Battelle Memorial Institute. Reacting materials. 4,983,517, Cl. 435-41.000.

Kim, Jin-Nam, to SamSung Electronics Co., Ltd. Video disk, disk player and method for long play mode constant angular velocity playback. 4,984,096, Cl. 358-342.000.

Kim, Sang I.: *See*—
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.

Kim, Sea C.: *See*—
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.

Kim, Seong: *See*—
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,984,182, Cl. 364-519.000.

Kim, Sun H., to Biomeasure, Inc. Immunomodulators and methods of making same. 4,983,567, Cl. 562-623.000.

Kim, Young I.: *See*—
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Eichel, Herman J.; and Massmann, Brent D., 4,983,401, Cl. 424-473.000.

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Keren-Zvi, Joseph; and King, Wayne M., 4,984,240, Cl. 371-8.200.
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Steer, Peter L.; and Edwards, John V., 4,983,172, Cl. 604-332.000.
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Kinoshita, Mikio; Ohta, Wasaburo; and Nakazawa, Masashi, to Ricoh Company, Ltd. Apparatus for forming thin film. 4,982,696, Cl. 118-723.000.
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Coben, Robert S.; Pierce, James M.; and Kinsey, William H., 4,983,393, Cl. 424-430.000.
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Van Linden, Jan H. L.; Kionosz, Michael J.; and Bowser, James R., 4,983,216, Cl. 75-672.000.
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Fukuchi, Hiroyuki, 4,983,822, Cl. 250-223.00B.
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Audeh, Costandi A.; Hoffman, Barry E.; and Kirker, Garry W., 4,983,277, Cl. 208-252.000.
Kirkpatrick, Alan D., to Robud Company. Die cutting anvil system. 4,982,639, Cl. 83-659.000.
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Cushman, Robert; Kirsch, Wolff M.; and Zhu, Yong H., 4,983,176, Cl. 606-151.000.
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Kishi, Mitsuhiro, to Hikoma Seisakusho Co., Ltd. Reinforcement mechanism for multi-stage telescopic boom. 4,982,853, Cl. 212-231.000.
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Tsugita, Takashi; Takeuchi, Shinya; Doi, Koichi; and Kishimoto, Fumito, 4,983,304, Cl. 210-640.000.
Kiso, Takeshi; and Masuda, Takanori, to Fuji Photo Film Co., Ltd. Method of measuring the period of surface defects. 4,982,600, Cl. 73-104.000.
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Becker, Helmut; and Kissling, Armin G., 4,983,945, Cl. 338-32.00R.
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Marki, Balz; and Wolfer, Peter, 4,982,608, Cl. 73-756.000.
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Harada, Tatsuo; Kurosaki, Toshiei; Kita, Toshiaki; and Terasawa, Tsuneo, 4,983,039, Cl. 356-328.000.
Kita, Yasuo, to Shimadzu Corporation. Nonstep speed change gear. 4,983,149, Cl. 475-76.000.
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Nakagawa, Asaharu, 4,983,148, Cl. 474-263.000.
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Kitazawa, Zenwemon: *See*—
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Kito, Yasutami: *See*—
Doi, Kazuhiko; and Kito, Yasutami, 4,982,816, Cl. 187-119.000.
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Klein, Heinz: *See*—
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Klein, Joseph T.: *See*—
Effland, Richard C.; Klein, Joseph T.; Davis, Larry; and Olsen, Gordon E., 4,983,608, Cl. 514-256.000.
Effland, Richard C.; Klein, Joseph T.; Olsen, Gordon E.; Davis, Larry; Hamer, Russell R. L.; and Freed, Brian S., 4,983,615, Cl. 514-337.000.
Klein, Wolfdieter; Strecker, Claus; Feuchthofen, Alfons; and Boenisch, Ulrich, to Veba Oel Aktiengesellschaft. Process for the hydrogenation of liquid charge materials which contain carbon. 4,983,279, Cl. 208-413.000.
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Kletzl, Franz; and Schafler, Winfried, to U.S. Philips Corporation. Recording and/or reproducing apparatus for a record carrier in tape form. 4,984,112, Cl. 360-96.600.
Kliman, Harvey L.; and Pike, Royden H., to Du Pont de Nemours, E. I., and Company. Method of simulating by computer the appearance properties of a fabric. 4,984,181, Cl. 364-518.000.
Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Konrad, Alfred, to Robert Bosch GmbH. Electromagnetically actuatable valve. 4,982,902, Cl. 239-585.000.
Kneib, Rudi: *See*—
Holzhauer, Horst; Loffler, Eberhard; and Kneib, Rudi, 4,984,269, Cl. 379-454.000.
Knelson, Benjamin. Centrifugal separator. 4,983,156, Cl. 494-28.000.
Knifton, John F.; and Su, Wei-Yang, to Texaco Chemical Company. Catalyst for the preparation of linear polyethylenepolyamines and method of preparing the catalyst. 4,983,565, Cl. 502-242.000.
Knoedler, Roy E.; Parker, Robert M.; Au, William G.; and Gebhard, Albert W., to Snugli, Inc. Bouncer infant carrier. 4,982,997, Cl. 297-296.000.
Knowlen, Carl: *See*—
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Knowles, Carl H., to Metrologic Instruments, Inc. Data acquisition system with laser scanner module. 4,983,818, Cl. 235-472.000.
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Duncan, James W.; and Knox, Lawner L., 4,983,259, Cl. 196-106.000.
Knudson, Leroy. Bale shredding device. 4,982,658, Cl. 100-007.000.
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Takayama, Norikazu; Ushijima, Nobuyoshi; Kobashi, Tetsuzo; Sato, Masahiko; Yano, Yoshihiko; Isozaki, Jun; Fujii, Kousuke; and Kudoh, Yoshinobu, 4,984,100, Cl. 360-49.000.
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Kobayashi, Isao: *See*—
Masui, Katsue; Kobayashi, Isao; Kubota, Shigeru; and Moriwaki, Toshimoto, 4,983,252, Cl. 156-630.000.
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, to Hitachi Seiko Ltd. Drawing system in a wire-cut electrodischarge machine. 4,983,802, Cl. 219-69.120.
Kobayashi, Masaharu, to NEC Corporation. Gate-array type intergated circuit semiconductor device. 4,984,050, Cl. 357-41.000.
Kobayashi, Masanari: *See*—
Makino, Kazumasa; Yoshihara, Hideo; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takeshi; Katoh, Tokunori; Morisaki, Hiroshi; Kobayashi, Masanari; and Asai, Shin, 4,984,009, Cl. 355-27.000.
Kobayashi, Masanori: *See*—
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Kobayashi, Shunsuke; Ikeno, Hidenori; Maeda, Hiroki; Zhang, Bai Y.; and Yoshida, Masaaki, to Tokyo University of Agriculture and Technology. Liquid crystal electrooptic memory device. 4,984,198, Cl. 365-108.000.
Kobayashi, Toyohiro: *See*—
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Kobayashi, Yasuhiro: *See*—
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Kobayashi, Yoshiaki: *See*—
Watanabe, Youji; Kobayashi, Yoshiaki; and Satoh, Kazuhiro, 4,984,000, Cl. 354-195.100.
Kobori, Hiromichi, to Kabushiki Kaisha Toshiba. Magnetoptic head for recording/erasing information using a cylindrical hollow permanent magnet. 4,984,226, Cl. 369-13.000.
Koboshi, Shigeharu: *See*—
Ishikawa, Masao; Koboshi, Shigeharu; Kuse, Satoru; and Kurematsu, Masayuki, 4,983,503, Cl. 430-393.000.

Kobs, Rolf U. D.: *See*—
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Koch, Dieter; and Baum, Hans-Jakob, to Bruker Franzen Analytik GmbH. Sampling device for inspection vehicles. 4,982,616, Cl. 73-864.810.
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Takeuchi, Setsuo; and Kochi, Mutsuyuki, 4,983,636, Cl. 514-699.000.
Koga, Kouhei, to Nissei ASB Machine Co., Ltd. Secondary injection molding machine for hollow molded products. 4,983,116, Cl. 425-517.000.
Koga, Kunimasa: *See*—
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Kogelschatz, Ulrich: *See*—
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Kogita, Hidekazu: *See*—
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Kogut, Walter, to Work Wear Corporation, Inc. Surgical gown with transfer card. 4,982,448, Cl. 2-51.000.
Koh, Jai O.: *See*—
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Kohara, Hidekatsu: *See*—
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Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, to Hitachi, Ltd. Method and apparatus for operating vacuum cleaner. 4,983,895, Cl. 318-254.000.
Kohjin Co., Ltd.: *See*—
Kojoh, Hisashi; Yamaguchi, Naoya; Tomoda, Kazuhiro; and Mizutani, Tomoji, 4,983,337, Cl. 264-41.000.
Kohn, Arnim: *See*—
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Kohno, Hideki: *See*—
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Kohno, Yoshiaki: *See*—
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Koike, Seiji: *See*—
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Koine, Richard, to Rheinmetall GmbH. Straight-action breech block system. 4,982,649, Cl. 89-28.050.
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Kojima, Ayako; and Masumoto, Hisayuki, to Minolta Camera Kabushiki Kaisha. Compact zoom lens system with a high zoom ratio. 4,983,027, Cl. 350-427.000.
Kojima, Toshihiko, to Yamato Mishin Seizo Kabushiki Kaisha. Button sewing machine. 4,982,673, Cl. 112-112.000.
Kojoh, Hisashi; Yamaguchi, Naoya; Tomoda, Kazuhiro; and Mizutani, Tomoji, to Kohjin Co., Ltd. Method and apparatus for producing stretched film. 4,983,337, Cl. 264-41.000.
Kokubo, Yuji, to Sony Corporation. Video camera shutter control by charge accumulation time of CCD images. 4,984,002, Cl. 358-213.130.
Kokubu, Sadao, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Snap action switching device. 4,983,794, Cl. 200-461.000.
Kokubun, Kozo: *See*—
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,084, Cl. 398-209.000.
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,090, Cl. 358-229.000.
Kokusai Electric Co., Ltd.: *See*—
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Kollmeier, Hans-Joachim: *See*—
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Komamura, Tawara: *See*—
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Komatsu, Takahiro; Yamasaki, Hiroyuki; Dosaka, Katsumi; and Tobita, Yoichi, to Mitsubishi Denki Kabushiki Kaisha. Random access memory with reduced access time in reading operation and operating method thereof. 4,984,206, Cl. 365-208.000.
Komatsu, Takahiro: *See*—
Kumanoya, Masaki; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Tobita, Youichi, 4,984,210, Cl. 365-222.000.
Komatsu, Toshiteru; and Miura, Kunio, to Kabushiki Kaisha Okuma Tekkosho. Numerical control apparatus for controlling a feed shaft and main shaft of a machine tool. 4,983,899, Cl. 318-571.000.
Komatsubara, Takeo: *See*—
Kaneko, Masato; Takagi, Minoru; Sunaga, Takashi; Komatsubara, Takeo; and Mutoh, Taira, 4,983,313, Cl. 252-68.000.
Komiya, Ryoichi: *See*—
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Komurasaki, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Acceleration detector. 4,982,599, Cl. 73-35.000.
Komuro, Hirokazu: *See*—
Sugata, Masao; Masaki, Tatsuo, deceased; Komuro, Hirokazu; Hirasawa, Shinichi; and Yano, Yasuhiro, 4,983,993, Cl. 346-76.0PH.
Komuro, Matahiro; Kozono, Yuzo; Narishige, Shinji; and Hanazono, Masanobu, to Hitachi, Ltd. Superconducting thin films mode of stacked composite oxide layers. 4,983,575, Cl. 505-001.000.
Komuro, Sintaro; Nitta, Yasushi; and Hatanaka, Ryuichi, to NEC Corporation. Printing control system for thermal printer. 4,983,989, Cl. 346-1.100.
Kondo, Hirokazu: *See*—
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Kondo, Masafumi: *See*—
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Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, to Ishihara Sangyo Kaisha Ltd.; and Green Cross Corporation, The. Pharmaceutical composition. 4,983,605, Cl. 514-247.000.
Kondo, Shinichi: *See*—
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Konica Corporation: *See*—
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Konishi, Hiroshi; Noguchi, Matsusaburo; Tadokoro, Joji; and Otaki, Noboru, to Oki Electric Industry Co., Ltd. Sheet feed mechanism. 4,982,942, Cl. 271-119.000.
Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic switch. 4,983,940, Cl. 335-126.000.
Konishi, Takeshi: *See*—
Okazaki, Susumu; Yamamoto, Takeshi; Kajimoto, Shinshi; Konishi, Takeshi; Hisanaga, Naogi; and Tanaka, Takahiko, 4,982,993, Cl. 296-192.000.
Konishi, Yasuhiro: *See*—
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Konrad, Alfred: *See*—
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Konstant, Anthony N. Supported pallet rack. 4,982,851, Cl. 211-151.000.
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Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.
Kooy, Wayne J.: *See*—
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Kubodera, Seiiti: *See*—
Nakamine, Takeshi; Ono, Michio; and Kubodera, Seiiti, 4,983,493, Cl. 430-201.000.

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Kunkel, Heinrich; and Olschewski, Armin, to SKF GmbH. Drive mechanism for pumps. 4,983,101, Cl. 417-362.000.

Kuramochi, Kojiro: *See*—
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Matsumoto, Mitsuo; Ohtsuka, Kiyoto; Sato, Koichi; and Okaya, Takuji, 4,983,318, Cl. 252-299.010.

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Sunami, Hideo; Ohkura, Makoto; Miyao, Masanobu; Kusukawa, Kikuo; Moniwa, Masahiro; Kimura, ShinIchiro; Warabisako, Terunori; and Kure, Tokuo, 4,984,038, Cl. 357-23.600.
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Kurita, Hitoshi; Senda, Hiroyuki; and Terasaki, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Controlling device for electric apparatus. 4,984,184, Cl. 364-551.010.
Kuroda, Takeshi: *See*—
Saitoh, Masao; Endo, Katsuhiko; Endoh, Yuzo; Kuroda, Takeshi; Saito, Makoto; and Shinkubo, Kenzo, 4,982,534, Cl. 52-63.000.
Kurodo, Hiroyuki: *See*—
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Kurosaki, Toshiei: *See*—
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Kusaka, Takao: *See*—
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Kusta, Fred A., to Self Manufacturing Company. Seal ring for open head drum. 4,982,864, Cl. 220-320.000.
Kuster, Hans-Werner; Vanaschen, Luc; and Promper, Hans-Josef, to Saint-Gobain Vitrage International. Apparatus for bending glass plates. 4,983,205, Cl. 65-290.000.
Kusukawa, Kikuo: *See*—
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Kuwata, Masayoshi: *See*—
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Kuwata, Satoshi; Goi, Takahiro; Shimizu, Takaaki; and Ogihara, Tsutomu, to Shin-Etsu Chemical Co., Ltd. Process of preparing silicone composition, and cosmetic and lustering materials containing silicone composition obtained. 4,983,388, Cl. 424-401.000.
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Kuzma, Leonard J.; and Castner, Kenneth F., to Goodyear Tire & Rubber Company, The. Molecular weight control of polybutadiene. 4,983,695, Cl. 526-142.000.
Kyocera America, Inc.: *See*—
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Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.
La Barge, Robert L., to Aluminum Company of America. Digitally openable, resealable container closure. 4,982,862, Cl. 220-278.000.
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Labonte, Paul D.: *See*—
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LaBounty, Jack, to Exchange System, The. Method and system for transmission of financial data. 4,984,270, Cl. 380-24.000.
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LaFarge Fondu International: *See*—
Mathieu, Alain, 4,983,220, Cl. 106-692.000.
Lafon, Louis, to Laboratoire L. Lafon. 1-(4-aminophenyl)-2-hexamethyleniminopropanone, and their use in therapy. 4,983,599, Cl. 514-212.000.
Lagana, Vincenzo; Ercolani, Dario ; and Donati, Elio, to Snamprogetti S.p.A. Method for preparing a high-concentration solids suspension in water. 4,983,187, Cl. 44-280.000.
Lai, Der-Shen: *See*—
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Lamb, Timothy J., to Hydro International Limited. Separator. 4,983,294, Cl. 210-521.000.
Lamb, Timothy J.; and Smisson, Robert P. M., to Hydro International Limited. Separator. 4,983,295, Cl. 210-521.000.
Lambert, Patrick M.: *See*—
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Lampman, David A.; Paley, Martyn N. J.; and McNally, James M., to Picker International, Inc. NMR spectroscopy with phase encoding within a selected voxel. 4,983,920, Cl. 324-309.000.
Land, Leo. Archery bow sight. 4,982,503, Cl. 33-265.000.
Landa, Benzion; Lavon, Amiran; Pinhas, Hanna; and Adam, Yossi, to Spectrum Sciences B.V. Imaging system with intermediate transfer member. 4,984,025, Cl. 355-274.000.
Landis, Abraham L.: *See*—
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Landowski, Roger W., to Allen-Bradley Company, Inc. Image processor with dark current compensation. 4,984,085, Cl. 358-213.160.
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Lange, Fredric A., to Interlock Structures International, Inc. Space frame node. 4,982,546, Cl. 52-648.000.
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Langlois, Jacques A. E., to U.S. Philips Corporation. Method of controlling the afterpressure variation with time of an injection-moulding machine. 4,983,336, Cl. 264-40.500.
Langner, Klaus A.: *See*—
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Lapcevic, Thomas G. Variable resistance exercise apparatus. 4,982,956, Cl. 272-118.000.
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lery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V., 4,982,780, Cl. 164-463.000.
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Lardinois, Pierre F.; Rouxhet, Paul G.; Stone, William E. E.; Baker, Kenneth M.; and Baudichau, Alain E., to Monsanto Company. Enzymes immobilized on latex polymer particles for use with an amino acid electrosensor. 4,983,510, Cl. 435-4.000.
Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., to ARCH Development Corp. Electromagnetic confinement for vertical casting or containing molten metal. 4,982,796, Cl. 164-467.000.
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Matsumoto, Hiroshi, to Kabushiki Kaisha Toshiba. Semiconductor device in which wiring layer is formed below bonding pad. 4,984,061, Cl. 357-68.000.
Matsumoto, Jun-ichi; Sasaki, Toyonori; and Touma, Kiyoshi, to Copal Company Limited. Device for opening and closing shutter blade without bounce. 4,984,003, Cl. 354-235.100.
Matsumoto, Kenji, to Bridgestone Corporation. Pneumatic tires having reduced negative ratio variation. 4,982,775, Cl. 152-209.00B.
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Matsumoto, Osamu, to Inax Corporation. Mechanism for supporting toilet bowl covering members. 4,982,453, Cl. 4-248.000.
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Matsuura, Fumiaki: *See*—
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Matsuura, Kiyoshi: *See*—
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Max-Planck-Gesellschaft zur Foerderung der Wissenschaften v.V.: *See*—
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McGrath, John. Inflatable container with self-sealing valve. 4,983,138, Cl. 446-224.000.
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McIlroy, M. Douglas; and Reeds, James A., to AT&T Bell Laboratories. Secure file handling in a computer operating system. 4,984,272, Cl. 380-25.000.
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McKenzie, Jennifer A. H., to Canadian Marconi Company. Radar detection of targets at short and long range. 4,983,979, Cl. 342-204.000.
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McSparran, Lloyd W., to Contraves Goerz Corporation. Radial magnetic bearing. 4,983,870, Cl. 310-90.500.
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Meanwell, Nicholas A., to Bristol-Myers Squibb Company. Pyrimidine carboxylic acids and esters. 4,983,610, Cl. 574-274.000.
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Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.
Meikle, Diane L., executrix: *See*—
Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.
Meinecke, Albrecht: *See*—
Loser, Hans; Chau-Huu, Tri; and Meinecke, Albrecht, 4,982,513, Cl. 34-116.000.
Meisezahl, William J.; Glogan, David J.; and Burnham, William L., to Eastman Kodak Company. Camera with flip-up flash unit. 4,983,999, Cl. 354-149.110.
Meito Sangyo Co., Ltd.: *See*—
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, 4,983,725, Cl. 536-4.100.
Meixner, Jugen; and Fischer, Wolfgang, to Bayer Aktiengesellschaft. Polyesters containing acryloyl groups and a process for their production. 4,983,712, Cl. 528-272.000.
Mekata, Yoshikazu, to Omron Tateisi Electronics Co. Automatic check-in apparatus. 4,984,156, Cl. 364-407.000.
Melbye, William L.: *See*—
Noreen, Allen L.; Crissinger, Dean R.; Melbye, William L.; Rodgers, Eric G.; Sipinen, Alan J.; and Wood, Leigh F., 4,983,174, Cl. 604-389.000.
Melitta-Werke Bentz & Sohn: *See*—
Hauslein, Reinhard, 4,983,412, Cl. 426-238.000.
Mels, Sherman J.: *See*—
Gupta, Goutam; and Mels, Sherman J., 4,983,266, Cl. 204-181.700.
Mercedes-Benz AG: *See*—
Hilburger, Walter; and Ochs, Siegfried, 4,982,807, Cl. 180-197.000.
Merck & Co., Inc.: *See*—
Dempski, Robert E.; Scholtz, Edward C.; Nibbelink, Donald W.; and Reines, Scott A., 4,983,400, Cl. 424-469.000.
Yang, Shu S.; Chiang, Yuan-Ching P.; Heck, James V.; and Chang, Michael N., 4,983,597, Cl. 514-210.000.
Merck Frosst Canada, Inc.: *See*—
Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., 4,983,628, Cl. 514-510.000.
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Durr, Heinz; and Bach, Volker, 4,983,324, Cl. 252-587.000.
Merdrignac, Odile; Guyader, Jean; Verdier, Patrick; Colin, Yves; and Laurent, Yves. Gallium nitride and oxynitrides used as selective detectors of reducing gases, process of making and device containing them. 4,983,360, Cl. 422-90.000.
Mero-Werke: *See*—
Hiller, Wolfgang, 4,982,539, Cl. 52-263.000.
Merour, Jean-Yves: *See*—
Buzas, Andre ; Merour, Jean-Yves; and Ollivier, Roland, 4,983,614, Cl. 514-317.000.
Merrick, Steven L. Compact disc protector. 4,983,437, Cl. 428-40.000.
Merz, Ludwig; Niemann, Klaus; and Wenning, Hans-Peter, to Veba Oel Entwicklungs-Gesellschaft mbH. Process for treating wastes and the like by low temperature carbonization and further processing of the low temperature carbonization oil. 4,983,782, Cl. 585-240.000.
Mesnel, Francois, to Mesnel S.A. Seal structures, particularly for automobile bodywork. 4,982,529, Cl. 49-491.000.
Mesnel S.A.: *See*—
Mesnel, Francois, 4,982,529, Cl. 49-491.000.

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Bongers, Bernd; Meurer, Rene; Oefner, Walter; Rode, Klaus; and Maier, Georg, 4,982,990, Cl. 295-21.000.
Messing, Dean S.; and Luthra, Ajay K., to Tektronix, Inc. Estimation of fiber loss and return signal power. 4,983,037, Cl. 356-73.100.
Metais, Joel; and Lehmann, Gerard, to LG Medical. Implantable device for access to the blood circulatory system. 4,983,162, Cl. 604-43.000.
Metal Casting Technology Inc.: *See*—
Chandley, George D., 4,982,777, Cl. 164-63.000.
Metallgesellschaft AG: *See*—
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MetriCor Inc.: *See*—
Sarski, Elric W.; and Lawrence, Dale M., 4,983,824, Cl. 250-227.270.
Metrologic Instruments, Inc.: *See*—
Knowles, Carl H., 4,983,818, Cl. 235-472.000.
Mette, Klaus; and Speiser, Helmut, to SKF Textilmaschinen-Komponenten GmbH. Spinning and twisting device. 4,982,562, Cl. 57-132.000.
Meul, Thomas, to Lonza, Ltd. 5-alkyl tetramic acids. 4,983,743, Cl. 548-544.000.
Meurer, Rene: *See*—
Bongers, Bernd; Meurer, Rene; Oefner, Walter; Rode, Klaus; and Maier, Georg, 4,982,990, Cl. 295-21.000.
Meyer, Gundolf, to BBC Brown Boveri AG. Composite superconductor. 4,983,574, Cl. 505-1.000.
Meyer, Norbert: *See*—
Rheinheimer, Joachim; Eicken, Karl; Theobald, Hans; Kuekenhoehner, Thomas; Westphalen, Karl-Otto; Wuerzer, Bruno; Frank, Juergen; and Meyer, Norbert, 4,983,210, Cl. 71-94.000.
Speakman, John-Bryan; Karl, Rudolf; Lorenz, Gisela; Ammermann, Eberhard; Wuerzer, Bruno; Meyer, Norbert; and Ditrich, Klaus, 4,983,587, Cl. 514-63.000.
Meyer, Richard S.; and Duersch, James W., to Curtice-Burns, Inc. Low-calorie polysiloxane oil food products. 4,983,413, Cl. 426-589.000.
Michel, Justin F. Prison cell locking and unlocking device. 4,982,528, Cl. 49-16.000.
Micheli, Adolph L.: *See*—
Mantese, Joseph V.; Micheli, Adolph L.; and Hamdi, Aboud H., 4,983,577, Cl. 505-1.000.
Michielsen, Theodorus M.: *See*—
Haisma, Jan; Michielsen, Theodorus M.; and Pals, Jan A., 4,983,251, Cl. 156-630.000.
Micro-Precision Operations Inc.: *See*—
Liechty, Deryll, 4,982,484, Cl. 29-229.000.
Microelectronics and Computer Technology: *See*—
Pan, Ju-Don T., 4,983,250, Cl. 156-628.000.
Mielke, Horst; Schmitt, Gerhard; and Herbert, Peter, to Metallgesellschaft AG. Apparatus for relieving a lock chamber for ash from pressure. 4,983,188, Cl. 48-87.000.
Mier, Gerhard, to Swiss Aluminium Ltd. Process for manufacture of a superconductor. 4,982,497, Cl. 29-599.000.
Mierek, James V. Screw type bale handling device. 4,983,087, Cl. 414-24.500.
Mif-Sud Industries, Inc.: *See*—
Murphy, Patrick M., 4,982,988, Cl. 294-81.610.
Migeon, Henri-Noel; and Rasser, Bernard, to Cameca. Time-of-flight analysis method with continuous scanning and analyzer to implement this method. 4,983,831, Cl. 250-309.000.
Migozzi, Jean-Blaise: *See*—
Bourguignat, Jerome; and Migozzi, Jean-Blaise, 4,983,015, Cl. 350-96.250.
Mii, Adam. Semiconductor element string structure. 4,984,057, Cl. 357-68.000.
Mijuskovic, Dejan, to Motorola, Inc. Analog-to-digital conversion by varying both inputs of a comparator utilizing successive approximation. 4,983,974, Cl. 341-156.000.
Mikawa, Ryozo, to Fortran Co., Ltd. Two piece construction wheel for an automobile. 4,982,998, Cl. 301-11.00R.
Mikawa, Takashi: *See*—
Miura, Shuichi; Mikawa, Takashi; Kuwatsuka, Haruhiko; and Yasuoka, Nami, 4,984,032, Cl. 357-16.000.
Miki, Yoshiaki; Ueda, Tsunehisa; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Deodorant composition and deodorant composite material. 4,983,441, Cl. 428-65.000.
Mikiya, Toshio; and Nakao, Haruki, to Nikko Co., Ltd. Bathtub having a pump, and bath system having a pump. 4,982,461, Cl. 4-544.000.
Milankov, Bosko; and Irvine, John K., to I.Q.F. Inc. Cryogenic apparatus. 4,982,577, Cl. 62-381.000.
Miles, Glen L.: *See*—
Lu, Nicky C.; Machesney, Brian J.; Mohler, Rick L.; Miles, Glen L.; Ting, Chung-Yu; and Warley, Stephen D., 4,983,544, Cl. 437-200.000.
Miles Inc.: *See*—
Bloom, James W.; Wong, Melvin F.; and Mitra, Gautam, 4,983,722, Cl. 530-387.000.
Millen, Ted I., to Correpro (Canada) Inc. Bandpass amplifier and receiver using bandpass amplifier. 4,984,292, Cl. 455-40.000.
Miller, Gary R.: *See*—
Gilson, Richard E.; and Miller, Gary R., 4,983,497, Cl. 430-272.000.
Miller, James S. Collapsible lobster or crab trap. 4,982,525, Cl. 43-105.000.
Miller, John W.: *See*—
Sauerwein, William D.; Miller, John W.; Vick, Stephen L.; and Bean, Rosemarie, 4,982,501, Cl. 30-376.000.
Miller, Lee, to British Aerospace Public Limited Company. Course correction unit. 4,982,913, Cl. 244-3.220.
Miller, Mark L.: *See*—
Taub, Alan I.; and Miller, Mark L., 4,983,228, Cl. 148-133.000.
Miller, Robert J.: *See*—
Minford, Eric; Prewo, Karl M.; and Miller, Robert J., 4,983,463, Cl. 428-435.000.
Miller, Scott R.; Raterman, John M.; and Ziecker, Roger A., to Nordson Corporation. Spray head attachment for metering gear head. 4,983,109, Cl. 425-7.000.
Miller, Vernon R.: *See*—
Dale, James L.; Miller, Vernon R.; and Roberts, Lincoln E., 4,983,128, Cl. 439-214.000.
Mills, George T., to United States of America, Navy. Video delta modulation encoder. 4,983,972, Cl. 341-143.000.
Mills, William P.: *See*—
Kidney, Paul D.; Rowlands, Andrew S.; and Mills, William P., 4,984,279, Cl. 382-1.000.
Milne, Douglas L., to NCR Corporation. Apparatus for detecting the passage of multiple superposed sheets along a feed path. 4,982,947, Cl. 271-263.000.
Mims, Joe L., Sr. Down hole pump. 4,983,105, Cl. 417-554.000.
Mimura, Tatsuo: *See*—
Arakawa, Shuji; and Mimura, Tatsuo, 4,984,289, Cl. 405-184.000.
Minakawa, Kuninori: *See*—
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Minami, Kenji: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Minami, Kenji; and Fukikawa, Iwao, 4,983,681, Cl. 525-290.000.
Minamitaka, Junichi, to Casio Computer Co., Ltd. Automatic composer. 4,982,643, Cl. 84-613.000.
Minford, Eric; Prewo, Karl M.; and Miller, Robert J., to United Technologies Corporation. Hybrid composite structures of fiber reinforced glass and resin matrices. 4,983,463, Cl. 428-435.000.
Ministry of International Trade & Industry: *See*—
Sakamoto, Hiroshi; Yamamoto, Mitsuru; and Ohya, Hitoshi, 4,982,906, Cl. 241-179.000.
Takeya, Naoya; Honma, Kazuhiro; and Matsuda, Kiyofumi, 4,983,004, Cl. 350-3.660.
Minnesota Mining and Manufacturing Company: *See*—
Almer, Carl J.; and Schultz, William J., 4,983,672, Cl. 525-65.000.
Backlurd, Richard A.; and Gerfast, Sten R., 4,984,119, Cl. 360-128.000.
Bailey, Terry R.; Tolliver, Howard R.; Degler, Douglas C.; and Chirhart, Dennis J., 4,983,436, Cl. 428-40.000.
Cobb, Sanford, Jr.; and Dreyer, John F., Jr., 4,984,144, Cl. 362-339.000.
Johnson, Bryce V.; and Kunde, Joyce M., 4,983,677, Cl. 525-127.000.
Truskolaski, Bernard S.; and Pohl, Daniel P., 4,983,664, Cl. 524-514.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ikemura, Masayuki; Karasaki, Takehiko; Inoue, Manabu; Katoh, Takehiro; Yamano, Yasuteru; and Hata, Koji, 4,984,006, Cl. 354-414.000.
Kojima, Ayako; and Masumoto, Hisayuki, 4,983,027, Cl. 350-427.000.
Kudo, Yoshinobu; and Kimura, Kazuo, 4,983,026, Cl. 350-422.000.
Matsushita, Kouji; and Yuge, Shizuo, 4,984,022, Cl. 355-246.000.
Nishise, Hideya; and Nishida, Akihiro, 4,984,026, Cl. 355-277.000.
Ueda, Hideaki, 4,983,480, Cl. 430-58.000.
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Bunting, William M., 4,983,246, Cl. 156-240.000.
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Long, Eliot R., 4,982,686, Cl. 118-406.000.
Miriam Collins-Palm Beach Laboratories Co.: *See*—
Baker, Debra; and McCardle, Mike, 4,982,749, Cl. 132-204.000.
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Mirsberger, Helmut: *See*—
Froehlich, Peter; Gebauer, Ludwig; Hartmann, Manfred; Mirsberger, Helmut; and Moench, Monika, 4,983,083, Cl. 411-82.000.
Misawa, Yukari: *See*—
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Miss D, Inc.: *See*—
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Mita, Seiichi: *See*—
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Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, to Hitachi, Ltd. Process for fabricating heterojunction bipolar transistors. 4,983,532, Cl. 437-31.000.
Mitani, Masao: *See*—
Yoshida, Isamu; Saeki, Junichi; Tsunoda, Shigeharu; Nishi, Kunihiko; and Mitani, Masao, 4,983,110, Cl. 425-116.000.
Mitao, Shinji; Tsuyama, Seishi; and Minakawa, Kuninori, to NKK Corporation. Heat-resistant TiAl alloy excellent in room-temperature fracture toughness, high-temperature oxidation resistance and high-temperature strength. 4,983,357, Cl. 420-418.000.

Mitchell, John S., to Stelco, Inc. Continuous annealing lines. 4,982,936, Cl. 266-249.000.
Mitnick, Neal I. Dental compress. 4,983,122, Cl. 433-229.000.
Mitra, Gautam: *See*—
Bloom, James W.; Wong, Melvin F.; and Mitra, Gautam, 4,983,722, Cl. 530-387.000.
Mitsubishi Denki Kabushiki Kaisah: *See*—
Araki, Hiroshi, 4,984,147, Cl. 363-84.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Arima, Junichi; Hirata, Yoshihiro; Harada, Hiroshi; Furuta, Isao; Harada, Shigeru; and Tamaki, Reiji, 4,983,547, Cl. 437-246.000.
Fujimoto, Hitoshi; and Tsumura, Kiyoaki, 4,984,056, Cl. 357-67.000.
Ishizu, Akira; Nishimura, Tadashi; and Inoue, Yasuo, 4,984,033, Cl. 357-17.000.
Kagawa, Hitoshi; and Yagi, Tetsuya, 4,984,243, Cl. 372-46.000.
Kawaguchi, Susumu; Shirafuji, Yoshinori; Maeyama, Hideaki; Sugita, Tatsuya; and Yamamoto, Takashi, 4,983,108, Cl. 418-63.000.
Kawaguchi, Takeo, 4,983,879, Cl. 313-402.000.
Kimura, Hiroshi; Sato, Kazunao; Matsumura, Mitsuie; and Hirai, Chika, 4,983,470, Cl. 429-16.000.
Komatsu, Takahiro; Yamasaki, Hiroyuki; Dosaka, Katsumi; and Tobita, Yoichi, 4,984,206, Cl. 365-208.000.
Komurasaki, Satoshi, 4,982,599, Cl. 73-35.000.
Konishi, Keiichi, 4,983,940, Cl. 335-126.000.
Kumabe, Hisao, 4,983,541, Cl. 437-129.000.
Kumanoya, Masaki; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Tobita, Youichi, 4,984,210, Cl. 365-222.000.
Masuda, Hisao; Fujimoto, Hitoshi; and Osaka, Shuichi, 4,982,728, Cl. 228-4.500.
Masui, Katsue; Kobayashi, Isao; Kubota, Shigeru; and Moriwaki, Toshimoto, 4,983,252, Cl. 156-630.000.
Naitou, Yasuo; and Mori, Akihiko, 4,982,805, Cl. 180-179.000.
Nishida, Fumihiko; and Yahata, Makoto, 4,984,017, Cl. 355-91.000.
Okuda, Hiroshi, 4,982,717, Cl. 123-603.000.
Okuda, Hiroshi, 4,983,136, Cl. 445-47.000.
Okumura, Yoshinori; Fujii, Atsuhiro; Nagatomo, Masao; Ozaki, Hiroji; Wakamiya, Wataru; and Matsukawa, Takayuki, 4,984,055, Cl. 357-54.000.
Shikama, Shinsuke; and Toide, Eiichi, 4,983,002, Cl. 350-3.600.
Sugahara, Takashi, 4,983,995, Cl. 354-1.000.
Tada, Tetsuo; and Takagi, Ryouichi, 4,983,908, Cl. 324-158.00P.
Tahara, Yasuyuki, 4,983,922, Cl. 324-320.000.
Takahashi, Toshihisa; Uchinami, Masanobu; Nishida, Shinichi; and Inoue, Hitoshi, 4,982,714, Cl. 123-488.000.
Tanaka, Noriyuki; and Morikane, Hiroyuki, 4,983,873, Cl. 310-248.000.
Tanaka, Toshinori, 4,983,941, Cl. 335-255.000.
Taneda, Atsushi, 4,983,800, Cl. 219-69.160.
Terashima, Tomohide, 4,984,063, Cl. 357-72.000.
Tsuji, Shintaro, 4,982,817, Cl. 187-127.000.
Tsutsumi, Yasutsugu; Tanaka, Sueyoshi; Takahashi, Tatsuro; Morita, Yutaka; Suezaki, Hideaki; and Yamada, Hiromichi, 4,983,111, Cl. 425-110.000.
Uemura, Shunichi; and Banjo, Toshinobu, 4,984,062, Cl. 357-70.000.
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Yamada, Michihiro; Miyamoto, Hiroshi; Yamagata, Tadato; and Mori, Shigeru, 4,984,054, Cl. 357-51.000.
Yamasaki, Katuhiko; Tanaka, Minoru; and Sekamoto, Kenichiro, 4,983,115, Cl. 425-228.000.
Yoneda, Masahiro; Hatanaka, Masahiro; Kohno, Yoshio; Satoh, Shinichi; Oda, Hidekazu; and Moriizumi, Koichi, 4,984,199, Cl. 365-149.000.
Yoshida, Shigekazu, 4,984,051, Cl. 357-42.000.
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Mitsubishi Gas Chemical Company, Inc.: *See*—
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Tanisake, Hiroka; Yamamoto, Koji; Hirota, Toshizumi; and Maruo, Kazunobu, 4,983,707, Cl. 528-193.000.
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Hagino, Sadaaki; Suzuki, Motokazu; Nishikawa, Shigeru; and Hayashi, Kenichi, 4,983,576, Cl. 505-1.000.
Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yanase, Yoshiyuki, 4,983,079, Cl. 408-230.000.
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Mitsubishi Paper Mills: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,983,569, Cl. 503-217.000.
Mitsubishi Paper Mills Limited: *See*—
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Mitsubishi Petrochemical Co., Ltd.: *See*—
Ishino, Iwao; Ohno, Akihiko; and Isaka, Tsutomu, 4,983,675, Cl. 525-100.000.
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Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, 4,983,644, Cl. 522-14.000.
Yoshida, Tomohiko; Handa, Ryoji; Tajiri, Noriyuki; Iwasaki, Hitochi; and Yoshihiro, Mituto, 4,983,660, Cl. 524-369.000.
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Hirai, Hideo; Ando, Masakatsu; Hashimoto, Yasuhiro; Fujimoto, Naoki; Tanaka, Norikazu; and Yamakawa, Susumu, 4,983,145, Cl. 474-117.000.
Mitsue Toatsu Chemicals, Inc.: *See*—
Yanagihara, Takeshi; Honda, Tsugio; Nakano, Makoto; and Kajino, Hiroshi, 4,983,450, Cl. 428-283.000.
Mitsuhashi, Kenhachi: *See*—
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Mitsui Construction Co., Ltd.: *See*—
Saitoh, Masao; Endo, Katsuhiko; Endoh, Yuzo; Kuroda, Takeshi; Saito, Makoto; and Shinkubo, Kenzo, 4,982,534, Cl. 52-63.000.
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Morii, Satoshi; Mitsui, Hiroyuki; and Iwasaki, Toshiaki, 4,982,676, Cl. 112-121.150.
Mitsui Petrochemical Industries, Ltd.: *See*—
Shigemoto, Hiromi; Takeda, Masami; and Muro, Tsuneaki, 4,983,674, Cl. 525-97.000.
Yamasaki, Kazuyuki; Yamamoto, Kimio; Watanabe, Masanobu; Kan, Kojiro; and Nakayama, Yoshio, 4,983,717, Cl. 528-317.000.
Yusawa, Motoyasu; and Igarashi, Chikara, 4,983,742, Cl. 524-436.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Hiai, Atsuhiko; Wakimura, Kazuo; Tanaka, Masao; and Tanaka, Takao, 4,983,462, Cl. 428-432.000.
Ueki, Toru; Sentoku, Hajime; Miyazaki, Takashi; and Sugihara, Eiichi, 4,983,435, Cl. 428-36.600.
Yoshida, Masatsugu; Maruyama, Seishiro; Ezawa, Hiroshi; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,983,238, Cl. 156-86.000.
Mitsuta, Toru: *See*—
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Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,983,825, Cl. 250-231.160.
Miura, Kunio: *See*—
Komatsu, Toshiteru; and Miura, Kunio, 4,983,899, Cl. 318-571.000.
Miura, Shuichi; Mikawa, Takashi; Kuwatsuka, Haruhiko; and Yasuoka, Nami, to Fujitsu Limited. Semiconductor photodiode. 4,984,032, Cl. 357-16.000.
Miwa, Hiroshi; Okude, Yoshitaka; Mizuguchi, Katsumi; and Okuda, Hidefumi, to Nippon Paint Co., Ltd. Curable composition. 4,983,715, Cl. 528-272.000.
Miwa, Katsuji: *See*—
Ogata, Akimitsu; Fujisaka, Hisato; Igarashi, Sadao; Nozu, Toshimitsu; Onozato, Katsura; Hirose, Masanobu; and Miwa, Katsuji, 4,983,976, Cl. 342-42.000.
Miyachi, Yoshifumi, to Sanyo Turk Co., Ltd. Mat-like lawngrass for transplantation and methods of manufacture and transplantation of the same. 4,982,526, Cl. 47-56.000.
Miyahara, Hitoshi: *See*—
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 4,983,802, Cl. 219-69.120.
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, to Meito Sangyo Co., Ltd.; and Daiichi Seiyaku Co., Ltd. Mannobiose derivatives. 4,983,725, Cl. 536-4.100.
Miyajima, Masaharu; Yamaguchi, Yukiya; Tsunematsu, Takao; and Oda, Toshihisa, to Zeria Pharmaceutical Co; and Nissan Chemical Industries Ltd. Pharmaceutical composition of dihydropyridine compound. 4,983,593, Cl. 514-110.000.
Miyake, Haruhisa; Ito, Hiroaki; Suzuki, Koji; and Yamada, Ryoji, to Asahi Glass Company Ltd. Four layer cation exchange fluoropolymer membrane. 4,983,264, Cl. 204-98.000.
Miyake, Katsuya: *See*—
Yoshizawa, Hiroyuki; Eguchi, Satoru; Shimanuki, Haruki; Miyake, Katsuya; and Hirobe, Yoshiaki, 4,982,806, Cl. 180-197.000.
Miyake, Ryo: *See*—
Ohki, Hiroshi; Miyake, Ryo; Yamazaki, Isao; and Takahata, Fujiya, 4,983,038, Cl. 356-246.000.
Miyamoto, Hiroshi: *See*—
Yamada, Michihiro; Miyamoto, Hiroshi; Yamagata, Tadato; and Mori, Shigeru, 4,984,054, Cl. 357-51.000.
Miyao, Masanobu: *See*—
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, 4,984,048, Cl. 357-34.000.
Sunami, Hideo; Kure, Tokuo; Kawamoto, Yoshifumi; Tamura, Masao; and Miyao, Masanobu, 4,984,030, Cl. 357-23.600.
Sunami, Hideo; Ohkura, Makoto; Miyao, Masanobu; Kusukawa, Kikuo; Moniwa, Masahiro; Kimura, ShinIchiro; Warabisako, Terunori; and Kure, Tokuo, 4,984,038, Cl. 357-23.600.
Miyaoka, Shuuichi; Tamba, Nobuo; Arai, Toshikazu; Higuchi, Hiroshi; and Higuchi, Hisayuki, to Hitachi Microcomputer Engineering, Ltd.; Hitachi, Ltd.; and Akita Electronics Co., Ltd. Semiconductor integrated circuit device. 4,984,058, Cl. 357-68.000.
Miyashita, Kunio; Hayashida, Hiroshi; Takahashi, Tadashi; and Kawamata, Syooichi, to Hitachi, Ltd. Actuator with stepping motion function. 4,983,893, Cl. 318-135.000.
Miyashita, Kunio: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.

Miyata, Takashi, to Hakodate Winery Ltd. Process for producing marmelo wines. 4,983,407, Cl. 426-15.000.

Miyauchi, Masahiro: *See*—
Hiraishi, Shigetoshi; Fuchigami, Mitsuru; Miyauchi, Masahiro; and Kabashima, Kazuo, 4,983,569, Cl. 503-217.000.

Miyazaki, Akihiko: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.

Miyazaki, Akira: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Miyazaki, Hiroshi: *See*—
Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, 4,983,532, Cl. 437-31.000.

Miyazaki, Takashi: *See*—
Kamishita, Takuzo; Miyazaki, Takashi; and Okuno, Yoshihide, 4,983,386, Cl. 424-78.000.
Ueki, Toru; Sentoku, Hajime; Miyazaki, Takashi; and Sugihara, Eiichi, 4,983,435, Cl. 428-36.600.

Miyazono, Tadafumi: *See*—
Numata, Syuhei; Ohiwa, Masanori; Maekawa, Toshihiro; Kashihara, Akio; and Miyazono, Tadafumi, 4,983,671, Cl. 525-63.000.

Miyoshi, Toshihiro; Kawashima, Masahiro; Ikuhara, Hideyuki; Kutsuki, Tetsuo; and Yamamoto, Kazuyasu, to Matsushita Electric Industrial Co., Ltd. Apparatus for receiving and selecting high-definition television (HDTV) signals and standard television (NTSC) signals. 4,984,081, Cl. 358-180.000.

Mizuguchi, Katsumi: *See*—
Miwa, Hiroshi; Okude, Yoshitaka; Mizuguchi, Katsumi; and Okuda, Hidefumi, 4,983,715, Cl. 528-272.000.

Mizuhara, Howard, to GTE Products Corporation. Titanium hydride. 4,983,213, Cl. 75-252.000.

Mizukami, Masao: *See*—
Sato, Yoichi; and Mizukami, Masao, 4,984,201, Cl. 365-154.000.
Sato, Yoichi; Mizukami, Masao; and Ookuma, Toshiyuki, 4,984,204, Cl. 365-189.110.

Mizuki, Shinya: *See*—
Huzino, Seizi; Mizuki, Shinya; Arai, Masumi; and Hattori, Tadashi, 4,983,469, Cl. 428-690.000.

Mizumura, Tetsuo: *See*—
Wakai, Kunio; and Mizumura, Tetsuo, 4,983,455, Cl. 428-336.000.

Mizuno, Masami: *See*—
Ohasi, Tamiyosi; Mizuno, Masami; Aoki, Tomohide; and Hokari, Osamu, 4,982,757, Cl. 137-202.000.

Mizuno, Toshiaki; Kimura, Shinji; Sugiura, Toshiaki; Sakuma, Mikio; Sugimoto, Tasuku; and Imaizumi, Mamoru, to Brother Kogyo Kabushiki Kaisha. Sheet detection apparatus with reflecting member. 4,983,854, Cl. 250-561.000.

Mizusawa, Eugene A.; Paone, Donald J.; Casella, Tracey L.; Flores, Dorothy L.; Choy, Clement K.; Gerritsen, Jan; Heiskell, Ronald E.; Dewees, Thomas; and Ellgen, Jon L., to Clorox Company, The. Rinse release laundry additive and dispenser. 4,982,467, Cl. 8-158.000.

Mizutani, Tomoji: *See*—
Kojoh, Hisashi; Yamaguchi, Naoya; Tomoda, Kazuhiro; and Mizutani, Tomoji, 4,983,337, Cl. 264-41.000.

Mobay Corporation: *See*—
Sanna, Frank, Jr., 4,983,643, Cl. 521-159.000.
Seneker, Stephen D.; Potter, Terry A.; and Dunlap, Kenneth L., 4,983,763, Cl. 560-352.000.

Mobil Oil Corp.: *See*—
Absil, Robert P. L.; Angevine, Philip J.; Bundens, Robert G.; and Herbst, Joseph A., 4,983,276, Cl. 208-120.000.
Audeh, Costandi A.; Hoffman, Barry E.; and Kirker, Garry W., 4,983,277, Cl. 208-252.000.
Benjamin, Linda A.; Horodysky, Andrew G.; Law, Derek A.; and Wu, Shi-Ming, 4,983,310, Cl. 252-32.70E.
Chen, Nai Y.; Degnan, Thomas F.; and Weisz, Paul B., 4,983,274, Cl. 208-111.000.
Davis, R. Michael; Sprunt, Eve S.; and Quigley, M. Scott, 4,982,604, Cl. 73-153.000.
Dennis, Charles L., 4,984,221, Cl. 367-69.000.
Furtek, Allan B., 4,983,694, Cl. 526-125.000.
Hunt, William C., III; and Phelps, Craig H., 4,982,790, Cl. 166-299.000.
Hunt, William C., III; and Phelps, Craig H., 4,982,791, Cl. 166-299.000.
Hunt, William C., III; and Phelps, Craig H., 4,982,792, Cl. 166-299.000.
Jennings, Alfred R., Jr., 4,982,786, Cl. 166-50.000.
Kennedy, Clinton R.; Shih, Stuart S.; and Ware, Robert A., 4,983,273, Cl. 208-89.000.
McWilliams, John P.; and Rubin, Mae K., 4,983,275, Cl. 208-111.000.
Osborn, Paul V., 4,982,637, Cl. 83-346.000.
Ritter, Sammie F.; and Caldwell, Stephen A., 4,984,218, Cl. 367-15.000.
Schwab, Frederick C., 4,983,645, Cl. 522-47.000.

Mochida, Haruo: *See*—
Takeda, Yoshimitsu; Mochida, Haruo; Kanai, Toshio; and Masaki, Mikio, 4,982,584, Cl. 70-252.000.

Mochizuki, Kouichi; Nakahara, Hiromi; and Yasunaga, Tadashi, to Fuji Photo Film Co., Ltd. Method for producing magnetic recording media. 4,983,421, Cl. 427-130.000.

Mochizuki, Masato: *See*—
Yamagishi, Hirofumi; Ohtsuka, Shigenobu; Kikuchi, Youichi; Isobe, Takayuki; and Mochizuki, Masato, 4,984,136, Cl. 362-66.000.

Mochizuki, Takeshi: *See*—
Matusita, Yoshio; Mochizuki, Takeshi; and Shiraishi, Ikuya, 4,982,897, Cl. 239-71.000.

Modlinski, Ulrich: *See*—
Krause, Hans; Roess, Rudi; and Modlinski, Ulrich, 4,983,913, Cl. 324-204.000.

Moeglich, Karl; and Pouli, Dirk, to Innova/Pure Water, Inc. Water deionization and contaminants removal or degradation. 4,983,267, Cl. 204-182.400.

Moench, Monika: *See*—
Froehlich, Peter; Gebauer, Ludwig; Hartmann, Manfred; Mirsberger, Helmut; and Moench, Monika, 4,983,083, Cl. 411-82.000.

Moerder, Karl E., to Titan Linkabit Corporation. Phase accumulator with dithered incrementing of accumulation due to fine phase components. 4,984,186, Cl. 364-721.000.

Moesinger, Hans: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedel, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 4,983,366, Cl. 423-240.000.

Moghe, Sanjay B.: *See*—
Ho, Pang-Ting; and Moghe, Sanjay B., 4,983,865, Cl. 307-571.000.

Mohler, Rick L.: *See*—
Lu, Nicky C.; Machesney, Brian J.; Mohler, Rick L.; Miles, Glen L.; Ting, Chung-Yu; and Warley, Stephen D., 4,983,544, Cl. 437-200.000.

Mohr, Dieter: *See*—
Rode, Klaus; Mohr, Dieter; and Frass, Werner, 4,983,498, Cl. 430-284.000.
Stahlhofen, Paul; and Mohr, Dieter, 4,983,478, Cl. 430-14.000.

Mokadam, Raghunath G.: *See*—
Vaidya, Jayant; and Mokadam, Raghunath G., 4,983,869, Cl. 310-90.500.

Moll, Norman G.; and Johnson, David R., to Dow Chemical Company, The. Methods for preparing a formed cellular plastic material pattern employed in metal casting. 4,983,640, Cl. 521-60.000.

Moller, Dieter; and Vorbeck, Udo, to BASF Lacke & Farben Aktiengesellschaft. Coating composition with extended pot life. 4,983,703, Cl. 528-49.000.

Molzahn, David C.: *See*—
Hartwell, George E.; Bowman, Robert G.; and Molzahn, David C., 4,983,735, Cl. 544-402.000.

Mombrun, Suzette L.; and Sedlak, Rudolf P., to RD Chemical Company. Cleaning compositions and methods for removing soldering flux. 4,983,224, Cl. 134-40.000.

Momont, Timothy W., to CTB, Inc. Floor waterer hanger. 4,982,699, Cl. 119-72.500.

Mondocea, Ionel; Grant, John P.; and Grant, Frederic F., to Datatape Incorporated. Apparatus for transporting a magnetic tape cassette. 4,984,107, Cl. 360-92.000.

Moniwa, Masahiro: *See*—
Sunami, Hideo; Ohkura, Makoto; Miyao, Masanobu; Kusukawa, Kikuo; Moniwa, Masahiro; Kimura, ShinIchiro; Warabisako, Terunori; and Kure, Tokuo, 4,984,038, Cl. 357-23.600.

Monneret, Claude: *See*—
Roger, Pierre; Choay, Patrick; Monneret, Claude; and Fournier, Jean-Paul, 4,983,726, Cl. 536-17.700.

Monsanto Company: *See*—
Lardinois, Pierre F.; Rouxhet, Paul G.; Stone, William E. E.; Baker, Kenneth M.; and Baudichau, Alain E., 4,983,510, Cl. 435-4.000.
Vandersall, Howard L., 4,983,326, Cl. 252-603.000.

Monsanto Japan Limited: *See*—
Sasaki, Shigeo, 4,983,650, Cl. 524-27.000.

Monte, William T.: *See*—
Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.

Montelione, Joseph. Metal detector scoop sifter. 4,983,281, Cl. 209-418.000.

Montgomery, David M. Boat lift apparatus. 4,983,067, Cl. 405-3.000.

Montgomery, Lionel C., to Union Carbide Coatings Service Technology Corporation. Method for forming a high density metal boride composite. 4,983,340, Cl. 264-63.000.

Montgomery, Raymond E.: *See*—
Garbelman, David L.; and Montgomery, Raymond E., 4,982,832, Cl. 198-735.300.

Monticello, Samuel A. Tape for hoof repair. 4,982,797, Cl. 168-4.000.

Montogomery, Dix S.: *See*—
Lee, Michael C.; Behrens, Robert N.; Dobberpuhl, Dale R.; Wykhuis, Lloyd A.; and Montogomery, Dix S., 4,982,762, Cl. 137-614.170.

Moore Business Forms, Inc.: *See*—
Jameson, John R., 4,983,438, Cl. 428-42.000.

Moore, E. Rex: *See*—
Evans, Joseph M.; Moore, E. Rex; and Sullivan, James B., 4,984,127, Cl. 361-179.000.

Moore, John F.: *See*—
Bernardi, Richard T.; and Moore, John F., 4,984,257, Cl. 378-13.000.
Moore, Robert A., to 810296 Ontario Inc. Vapor injection system for refrigeration units. 4,982,572, Cl. 62-122.000.
Moore, Stanley R.: *See*—
Franklin, Hunter M., 4,982,490, Cl. 29-407.000.
Moorehead, Harvey R., to Catheter Technology Corporation. Medical layered peel away sheath and methods. 4,983,168, Cl. 604-161.000.
Moran, Alfred A., to Electrovert, Ltd. Flux density control system. 4,982,755, Cl. 137-3.000.
More, Nicholas; Thompson, Ian C.; and Walton, John N., to Hedley Purvis Limited. Hydraulic torque wrench. 4,982,626, Cl. 81-57.390.
Morell, Joseph, to Salomon S.A. Golf ball. 4,982,964, Cl. 273-232.000.
Morgan, H. William, Jr. Seamless filter bag and method of its manufacture. 4,983,292, Cl. 210-491.000.
Mori, Akihiko: *See*—
Naitou, Yasuo; and Mori, Akihiko, 4,982,805, Cl. 180-179.000.
Mori, Kei. Accumulator arrangement for the sunlight energy. 4,982,723, Cl. 126-440.000.
Mori, Keiji; and Kogita, Hidekazu, to Aisin Seiki Kabushiki Kaisha. Retractable mirror apparatus. 4,982,926, Cl. 248-479.000.
Mori, Ryoya, to Kabushiki Kaisha Toshiba. Virtual memory control management system. 4,984,150, Cl. 364-200.000.
Mori, Shigeru: *See*—
Yamada, Michihiro; Miyamoto, Hiroshi; Yamagata, Tadato; and Mori, Shigeru, 4,984,054, Cl. 357-51.000.
Mori, Takashi; and Sasaki, Eiichi, to Ricoh Company, Ltd. Thermal transfer type printing device. 4,983,994, Cl. 346-76.0PH.
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Minami, Kenji; and Fukikawa, Iwao, to Nippon Shokubai Kagaku Kogyo Kabushiki Kaisha. Colored microfine globular particles, method for production thereof, and uses thereof. 4,983,681, Cl. 525-290.000.
Morigaki, Masakazu: *See*—
Takahashi, Osamu; Naruse, Hideaki; Morigaki, Masakazu; Ohki, Nobutaka; and Furutachi, Nobuo, 4,983,507, Cl. 430-551.000.
Moriguchi, Fujio: *See*—
Kato, Nobuhisa; and Moriguchi, Fujio, 4,984,092, Cl. 358-298.000.
Morii, Satoshi; Mitsui, Hiroyuki; and Iwasaki, Toshiaki, to Brother Kogyo Kabushiki Kaisha. Pocket cloth folding device of a pocket setter. 4,982,676, Cl. 112-121.150.
Moriizumi, Koichi: *See*—
Yoneda, Masahiro; Hatanaka, Masahiro; Kohno, Yoshio; Satoh, Shinichi; Oda, Hidekazu; and Moriizumi, Koichi, 4,984,199, Cl. 365-149.000.
Morikane, Hiroyuki: *See*—
Tanaka, Noriyuki; and Morikane, Hiroyuki, 4,983,873, Cl. 310-248.000.
Morikawa, Nobuyuki: *See*—
Otani, Atsushi; Shirotori, Hidefumi; Morikawa, Nobuyuki; and Otani, Shunsuke, 4,982,970, Cl. 279-123.000.
Morimoto, Hideaki, to NEC Corporation. Channel switching system. 4,984,252, Cl. 375-38.000.
Morimoto, Kiyoshi: *See*—
Ishiguro, Shoji; and Morimoto, Kiyoshi, 4,983,508, Cl. 430-569.000.
Morimoto, Taiji: *See*—
Yamamoto, Saburo; Morimoto, Taiji; Sasaki, Kazuaki; Kondo, Masaki; Suyama, Takahiro; and Kondo, Masafumi, 4,984,244, Cl. 372-461.000.
Morimura, Atsushi: *See*—
Uomori, Kenya; and Morimura, Atsushi, 4,984,074, Cl. 358-105.000.
Morisaki, Hiroshi: *See*—
Makino, Kazumasa; Yoshihara, Hideo; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takeshi; Katoh, Tokunori; Morisaki, Hiroshi; Kobayashi, Masanari; and Asai, Shin, 4,984,009, Cl. 355-27.000.
Morita, Yutaka: *See*—
Tsutsumi, Yasutsugu; Tanaka, Sueyoshi; Takahashi, Tatsuro; Morita, Yutaka; Suezaki, Hideaki; and Yamada, Hiromichi, 4,983,111, Cl. 425-110.000.
Moriwaki, Toshimoto: *See*—
Masui, Katsue; Kobayashi, Isao; Kubota, Shigeru; and Moriwaki, Toshimoto, 4,983,252, Cl. 156-630.000.
Moriyama, Masashi, to Tokyo Electron Limited. Automatic coating system. 4,982,694, Cl. 118-697.000.
Moriyama, Shigeo: *See*—
Itou, Masaaki; and Moriyama, Shigeo, 4,984,259, Cl. 378-146.000.
Mormile di Campochiaro, Chiara: *See*—
Gessa, Gian Luigi; Fadda, Fabio; and Mormile di Campochiaro, Chiara, 4,983,632, Cl. 514-557.000.
Morpheus Lights, Inc.: *See*—
Richardson, Brian E., 4,984,143, Cl. 362-293.000.
Morris, Arthur J.: *See*—
Pringle, Ronald E.; and Morris, Arthur J., 4,983,803, Cl. 219-69.170.
Morris, John C., to Orthopedic Technology, Inc. Orthopedic rehabilitation knee brace. 4,982,732, Cl. 128-80.00C.
Morris, William F., Jr. Reverse cycle type refrigeration system with water cooled condenser and economizer feature. 4,982,574, Cl. 62-155.000.
Motorola, Inc.: *See*—
Brown, Daniel P.; and Puhl, Larry C., 4,984,219, Cl. 380-39.000.
Cosentino, Stephen J., 4,983,531, Cl. 437-31.000.
Engstrom, Scott M.; Myers, Christopher A.; and Terry, Brian K., 4,984,295, Cl. 455-186.000.
Levine, Stephen N.; and Puhl, Larry, 4,984,290, Cl. 455-33.000.
Mijuskovic, Dejan, 4,983,974, Cl. 341-156.000.
Pfiester, James R.; Baker, Frank K.; and Sivan, Richard D., 4,984,042, Cl. 357-23.900.
Smith, Robert, 4,984,266, Cl. 379-399.000.
Motoyama, Takushi: *See*—
Sato, Yasuhisa; and Motoyama, Takushi, 4,983,543, Cl. 437-192.000.
Motoyama, Tetsuro: *See*—
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,984,182, Cl. 364-519.000.
Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Fixing frame and filter unit for connectors. 4,983,935, Cl. 333-184.000.
Mozes, Gyula: *See*—
Balint, Tibor; Drozda, Tamas; Mozes, Gyula; Kristof, Mihaly; Hanel, Eva; and Tilky, Peter, 4,983,302, Cl. 210-638.000.
MP Acquisition Corp.: *See*—
Madan, Michael K.; Malhotra, Vinod; and Loh, William, 4,982,844, Cl. 206-506.000.
MSC Technologies, Inc.: *See*—
Massoudi, Firooz, 4,984,287, Cl. 382-59.000.
Mt. Vernon Plastics Corporation: *See*—
Curliss, Danny R.; and Looney, Dwight E., 4,983,346, Cl. 264-328.100.
Muelas-Medrano, Santiago: *See*—
Vidal, Henri; and Muelas-Medrano, Santiago, 4,982,550, Cl. 52-747.000.
Mueller, Herbert: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedel, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 4,983,366, Cl. 423-240.000.
Mueller, Karl F.; and Harisiades, Paul, to Ciba-Geigy Corporation. Crosslinked siloxane-urethane polymer contact lens. 4,983,702, Cl. 528-28.000.
Muhlethaler, Erhard, to Lanz Oensingen AG. Conduit device in a window parapet. 4,982,536, Cl. 52-220.000.
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, to Mitsubishi Rayon Company, Limited. Dental adhesive composition. 4,983,644, Cl. 522-14.000.
Mukainaru, Masahito: *See*—
Gokan, Hiroshi; Mukainaru, Masahito; Suzuki, Masayoshi; Tsuge, Hisanao; and Matsuya, Hidehiko, 4,983,545, Cl. 437-228.000.
Mullen, James E.; and Jurkiewicz, James S., to Chrysler Corporation. Combination illuminated entry/security alarm disarm switch system. 4,983,947, Cl. 340-426.000.
Muller, Armin; and Cordt, Hartmut, to Daimler-Benz AG. Method and apparatus for adapting slip threshold values for a propulsion slip and/or braking slip control system to the tires of a motor vehicle. 4,984,165, Cl. 364-426.020.
Muller, Friedemann: *See*—
Kress, Hans-Jurgen; Kauth, Heremann; Peters, Horst; Lindner, Christian; and Muller, Friedemann, 4,983,658, Cl. 524-141.000.
Muller, Jean-Claude: *See*—
Cavero, Icilio; Elkik, Francois; Hicks, Peter; and Muller, Jean-Claude, 4,983,598, Cl. 514-211.000.
Muller, Manfred; Hess, Joachim; Schnell, Wilhem-Gustav; Bendix, Dieter; and Entenmann, Gunther, to Boehringer Ingelheim KG. Meso-lactide, processes for preparing it and polymers and copolymers produced therefrom. 4,983,745, Cl. 549-274.000.
Muller, Michael J., to Bell Communications Research, Inc. System for controlling computer processing utilizing a multifunctional cursor with decoupling of pointer and image functionalities in space and time. 4,984,152, Cl. 364-200.000.
Mulliner, Richard R.: *See*—
Maruko, Shuji U.; and Mulliner, Richard R., 4,982,487, Cl. 29-243.580.
Mumford, Ronald W. J.; and Mead, Terence W., to Rank Cintel Ltd. Scanner with electronically variable raster to produce picture effects. 4,984,086, Cl. 358-216.000.
Munaoka, Yutaka, to Nippondenso Co., Ltd. Contour detecting apparatus. 4,984,075, Cl. 358-107.000.
Mundus, Friedhelm, to Windmoller & Holscher. Apparatus for stacking flat workpieces on stacking pins or an endless conveying element. 4,983,088, Cl. 414-27.000.
Muneyuki, Ryonosuke; and Kanamaru, Hiroyuki, to S.T. Chemical Co., Ltd. Fabric insecticide. 4,983,391, Cl. 424-408.000.
Munker, Friedrich; and Barten, Axel. Gearshift system. 4,982,617, Cl. 74-333.000.
Munro, Hugh S.: *See*—
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Munroe, John E.: *See*—
Blaszczak, Larry C.; Munroe, John E.; and Spry, Douglas O., 4,983,732, Cl. 540-360.000.
Murabayashi, Noboru: *See*—
Kanota, Keiji; and Murabayashi, Noboru, 4,984,101, Cl. 360-65.000.
Murai, Fumio; and Okazaki, Shinji, to Hitachi, Ltd. Electronic beam drawing apparatus. 4,983,864, Cl. 250-492.200.
Murai, Fumio: *See*—
Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, 4,983,532, Cl. 437-31.000.
Murai, Takayuki: *See*—
Nagaoka, Takeshi; Yoshioka, Takashi; Kamagata, Kazuo; Sawa, Natsuo; and Murai, Takayuki, 4,983,485, Cl. 430-110.000.

Murakami, Eiichi: *See*—
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, 4,984,048, Cl. 357-34.000.

Murakami, Mutsuaki; Yoshimura, Susumu; Nishiki, Naomi; Nakamura, Katsuyuki; and Watanabe, Kazuhiro, to Matsushita Electric Industrial Co., Ltd. Process for producing graphite blocks. 4,983,244, Cl. 156-224.000.

Murakami, Yoshikazu; Ogihara, Takahiro; Okamoto, Tsutomu; and Niikura, Kanako, to Sony Corporation. Ferromagnetic resonance device. 4,983,936, Cl. 333-202.000.

Muramoto, Tomotaka: *See*—
Takayama, Makoto; Sakata, Tsuguhide; and Muramoto, Tomotaka, 4,984,095, Cl. 358-336.000.

Muranushi, Fumitaka: *See*—
Takeuchi, Yoshinori; Yamaguchi, Yuzo; Tanaka, Katsuyuki; Muranushi, Fumitaka; and Daito, Hiroshi, 4,984,114, Cl. 360-103.000.

Murase, Kiyoshi: *See*—
Iwashita, Takashi; Awazu, Koichi; and Murase, Kiyoshi, 4,984,149, Cl. 364-200.000.

Murase, Norio: *See*—
Yasuoka, Hiroshi; Murase, Norio; Terao, Motoyasu; Nishida, Tetsuya; Andoo, Keikichi; and Ojima, Masahiro, 4,984,231, Cl. 369-275.100.

Murata, Atsuko: *See*—
Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,983,751, Cl. 558-272.000.

Murata, Hiroshi; and Yasuguchi, Masayuki, to Nisshin Flour Milling Co., Ltd.; and Nisshin Engineering Co., Ltd. Mixer. 4,983,046, Cl. 366-312.000.

Murata Manufacturing Co., Ltd.: *See*—
Nakaya, Shunsuke; Sano, Harunobu; and Kohno, Yoshiaki, 4,982,485, Cl. 29-25.420.
Okumura, Mitsunao, 4,983,934, Cl. 333-184.000.
Uchida, Katsuyuki; and Takahata, Haruo, 4,983,944, Cl. 338-22.00R.

Murata, Masakazu; Nagashima, Yoshinao; Hara, Kenji; Kayane, Shigeto; and Imamura, Takashi, to Kao Corporation. Preventive and therapeutic method for hypertension. 4,983,582, Cl. 514-23.000.

Murata, Masanao, to Olympus Optical Co., Ltd. Apparatus for photographing or projecting an image for a CRT or laser diode array. 4,984,091, Cl. 358-244.000.

Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, to Fujisawa Pharmaceutical Company, Ltd. 3-pyrrolidinylthio-1-azabicyclo[3.2.0]-hept-2-ene-2-carboxylic acid derivatives and their preparation. 4,983,596, Cl. 514-210.000.

Murata, Norikazu: *See*—
Nagai, Aisaku; and Murata, Norikazu, 4,983,838, Cl. 250-338.300.

Murata, Shinichi; Yamauchi, Yoshiyuki; Kusaka, Takao; Sawa, Takao; and Yagi, Noriaki, to Kabushiki Kaisha Toshiba. Magnetic core and method of manufacturing same. 4,983,943, Cl. 336-213.000.

Murata, Yasuo: *See*—
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, 4,983,747, Cl. 549-423.000.

Muraz, Pierre: *See*—
Sultan, Bernard; and Muraz, Pierre, 4,982,615, Cl. 73-864.510.

Muro, Tsuneaki: *See*—
Shigemoto, Hiromi; Takeda, Masami; and Muro, Tsuneaki, 4,983,674, Cl. 525-97.000.

Murphy, Carolyn S.; and Prausnitz, Mark R., to Procter & Gamble Company, The. Silicone hairspray compositions. 4,983,377, Cl. 424-47.000.

Murphy, Carolyn S.; and Prausnitz, Mark R., to Procter & Gamble Company, The. Silicone hairspray compositions. 4,983,418, Cl. 424-47.000.

Murphy, Carolyn S.: *See*—
Maksimoski, Richard C.; and Murphy, Carolyn S., 4,983,383, Cl. 424-70.000.

Murphy, Patrick M., to Mif-Sud Industries, Inc. Side panel clamp mechanism. 4,982,988, Cl. 294-81.610.

Murray Corporation: *See*—
Proctor, Robert H.; and Eichenlaub, Dennis P., 4,982,576, Cl. 62-292.000.

Murti, Dasarao K.: *See*—
Ong, Beng S.; Murti, Dasarao K.; and Alexandru, Lupu, 4,983,482, Cl. 430-59.000.

Musillo, Robert G. Golf tee gauge. 4,982,510, Cl. 33-833.000.

Musk, Robert W., to BT&D Technologies Limited. Light transmitting device utilizing indirect reflection. 4,983,009, Cl. 350-96.180.

Mustaklem, Issa, to Flotec, Inc. Three-way valve with radial seal. 4,982,760, Cl. 137-559.000.

Musto, Dominick J.: *See*—
Ernst, James J.; Williamson, Steven; Rogers, George; and Musto, Dominick J., 4,983,124, Cl. 434-226.000.

Muto, Toshiaki: *See*—
Kawaguchi, Yasunobu; Muto, Toshiaki; and Ichinokawa, Taisuo, 4,983,064, Cl. 403-30.000.

Mutoh, Taira: *See*—
Kaneko, Masato; Takagi, Minoru; Sunaga, Takashi; Komatsubara, Takeo; and Mutoh, Taira, 4,983,313, Cl. 252-68.000.

Myers, Christopher A.: *See*—
Engstrom, Scott M.; Myers, Christopher A.; and Terry, Brian K., 4,984,295, Cl. 455-186.000.

Myers, Robert A.: *See*—
Krall, Thomas J.; and Myers, Robert A., 4,983,349, Cl. 264-509.000.

N. V. Bekaert S.A.: *See*—
De Bruyne, Roger; Schepens, Herve ; Lefever, Ignace; and Losfeld, Ronny, 4,983,467, Cl. 428-605.000.

Naeve, Ambjorn: *See*—
Soderberg, Bo; Pettersson, Bo; Hocke, Ulf; and Naeve, Ambjorn, 4,982,504, Cl. 33-502.000.

Nagae, Tuyoshi, to Brother Kogyo Kabushiki Kaisha. Tape holding case. 4,983,058, Cl. 400-249.000.

Nagahashi, Toshio; Yamashita, Kiyoshi; and Sato, Minoru, to Tokyo Automatic Machinery Works, Ltd. Carton assembling method and equipment. 4,983,154, Cl. 493-315.000.

Nagai, Aisaku; and Murata, Norikazu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pyroelectric element. 4,983,838, Cl. 250-338.300.

Nagai, Yoshitaka; Arase, Makoto; and Ohatake, Norio, to Yoshida Kogyo K.K. Shut-off device for use in a guide conduit of a horizontal continuous casting apparatus. 4,982,779, Cl. 164-152.000.

Nagaoka, Kyoko: *See*—
Tsutsumi, Yoshitaka; Seita, Toru; Matsumura, Kousaburou; Nagaoka, Kyoko; and Yanagihara, Toshimitsu, 4,983,495, Cl. 430-270.000.

Nagaoka, Takeshi; Yoshioka, Takashi; Kamagata, Kazuo; Sawa, Natsuo; and Murai, Takayuki, to Shikoku Chemicals Corporation. Positively chargeable toner. 4,983,485, Cl. 430-110.000.

Nagasaka, Masumi: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Nagasawa, Takeshi: *See*—
Kuriowa, Katsumasa; Katayama, Katsuhiro; and Nagasawa, Takeshi, 4,983,756, Cl. 560-56.000.

Nagase, Hiroshi: *See*—
Masaki, Ryoso; Kayama, Masahiro; Hayashida, Hiroshi; Nihei, Hideki; Katayama, Yasunori; Nagase, Hiroshi; Matsuda, Toshihiko; and Kamiyama, Kenzo, 4,983,875, Cl. 310-323.000.

Nagashima, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording-/reproduction apparatus having negative and positive pressure generating members for deforming a flexible magnetic disk. 4,984,121, Cl. 360-130.340.

Nagashima, Yoshinao: *See*—
Murata, Masakazu; Nagashima, Yoshinao; Hara, Kenji; Kayane, Shigeto; and Imamura, Takashi, 4,983,582, Cl. 514-23.000.

Nagata, Nobuo; and Hirokawa, Yoshitsugu, to Nippon Zeon Co., Ltd. Level-variable supporting apparatus. 4,982,465, Cl. 5-450.000.

Nagato, Shoin: *See*—
Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,983,751, Cl. 558-272.000.

Nagatomo, Masao: *See*—
Okumura, Yoshinori; Fujii, Atsuhiro; Nagatomo, Masao; Ozaki, Hiroji; Wakamiya, Wataru; and Matsukawa, Takayuki, 4,984,055, Cl. 357-54.000.

Nagatsuna, Akemi; and Kabeya, Noriaki, to Brother Kogyo Kabushiki Kaisha. Adjusting vertical line length in frame printer. 4,983,052, Cl. 400-17.000.

Nagayama, Yoshikatsu: *See*—
Hibino, Hiroki; Nagayama, Yoshikatsu; Yoshikawa, Mutsumi; Takara, Toshiyuki; Goto, Masahito; Suzuki, Akira; Takehana, Sakae; Oaki, Yoshinao; Yoshimitsu, Koichi; and Aoki, Yoshisada, 4,982,725, Cl. 128-4.000.

Nagel, Peter; and Schmid, Franz. Multiple-spindle automatic lathe. 4,982,634, Cl. 82-129.000.

Naiman, Michael I.; and Chang, James C., to Petrolite Corporation. Methods and compositions for reduction of drag in hydrocarbon fluids. 4,983,186, Cl. 44-394.000.

Naitou, Yasuo; and Mori, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Constant-speed cruise control apparatus for a vehicle. 4,982,805, Cl. 180-179.000.

Nakabayashi, Kazuto, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 4,983,918, Cl. 324-309.000.

Nakada, Masahiro: *See*—
Utsumi, Kenichi; Koshino, Nagaaki; Goto, Yasuyuki; Tsugawa, Iwao; and Nakada, Masahiro, 4,984,232, Cl. 369-277.000.

Nakagawa, Asaharu, to Kitagawa Industries Co., Ltd. Mechanical component consisting of anti-static material. 4,983,148, Cl. 474-263.000.

Nakagawa, Katsuya, to Nintendo Co., Ltd. Memory cartridge. 4,984,193, Cl. 364-900.000.

Nakagawa, Kazuko: *See*—
Torii, Hiroshi; Oishi, Minoru; Ban, Tomohiro; Furukawa, Akihiro; Furushima, Tokihito; and Nakagawa, Kazuko, 4,984,162, Cl. 364-518.000.

Nakagawa, Kenichi; Kitazawa, Takeshi; and Kitamura, Takashi, to Sharp Kabushiki Kaisha; Kitazawa Yakuhin Co., Ltd.; and Tosoh Corporation. Liquid crystal display panel with polymer spacers containing a percentage of epoxy groups. 4,983,023, Cl. 350-344.000.

Nakahara, Hiromi: *See*—
Mochizuki, Kouichi; Nakahara, Hiromi; and Yasunaga, Tadashi, 4,983,421, Cl. 427-130.000.

Nakajima, Masaru: *See*—
Nakano, Shinzo; and Nakajima, Masaru, 4,983,243, Cl. 156-192.000.

Nakajima, Shin; Yamataka, Akira; Shimizu, Hideaki; Yamauchi, Kiyotaka; and Arakawa, Shunsuke, to Hitachi Metals, Ltd. Magnetic

device for high-voltage pulse generating apparatuses. 4,983,859, Cl. 307-419.000.

Nakajima, Takashi: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,983,596, Cl. 514-210.000.

Nakajima, Tsunetaka: *See*—
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,983,605, Cl. 514-247.000.

Nakajima, Yoshihiro: *See*—
Nakazawa, Takeshi; Hashimoto, Jun; Nakamura, Shinichi; Yamazaki, Katsumi; Nakajima, Yoshihiro; Hayashi, Tsutomu; Ichikawa, Tetsuya; Yakigaya, Nobuyuki; Katahira, Kiyoshi; and Takeshima, Yoshinobu, 4,984,161, Cl. 364-424.100.

Nakamichi Corporation: *See*—
Inoue, Yoshihisa, 4,984,110, Cl. 360-95.000.

Nakamine, Takeshi; Ono, Michio; and Kubodera, Seiiti, to Fuji Photo Film Co., Ltd. Dyes for heat sensitive transfer recording. 4,983,493, Cl. 430-201.000.

Nakamura, Eitaro; Yamakawa, Masahiro; Nakayama, Akira; and Takano, Fumio, to Nippon Zeon Co., Ltd. Magnetic coating and magnetic recording medium. 4,983,311, Cl. 252-62.540.

Nakamura, Hiroshi, to Fuji Photo Film Co., Ltd. Image recording apparatus. 4,984,010, Cl. 355-27.000.

Nakamura, Katsuyuki: *See*—
Murakami, Mutsuaki; Yoshimura, Susumu; Nishiki, Naomi; Nakamura, Katsuyuki; and Watanabe, Kazuhiro, 4,983,244, Cl. 156-224.000.

Nakamura, Kazunari: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.

Nakamura, Masayuki; and Ikuta, Fujiya, to Hitachi, Ltd.; and Hitachi Chubu Software, Ltd. Extended bus controller. 4,984,195, Cl. 364-200.000.

Nakamura, Satoshi; Simizu, Teruo; Naruse, Reizo; and Igawa, Hiroyuki, to Nippon Keiki Works, Ltd. Piezoelectric pump assembly. 4,983,876, Cl. 310-328.000.

Nakamura, Shinichi: *See*—
Imanaga, Koujiro; Nakamura, Shinichi; Hosono, Hideji; and Yanase, Yoshiyuki, 4,983,079, Cl. 408-230.000.
Nakazawa, Takeshi; Hashimoto, Jun; Nakamura, Shinichi; Yamazaki, Katsumi; Nakajima, Yoshihiro; Hayashi, Tsutomu; Ichikawa, Tetsuya; Yakigaya, Nobuyuki; Katahira, Kiyoshi; and Takeshima, Yoshinobu, 4,984,161, Cl. 364-424.100.

Nakamura, Takeaki: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.

Nakamura, Teruya: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,983,328, Cl. 260-404.500.

Nakamura, Tetsuo: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Aono, Koji; Doki, Ryoichi; Kuwazuru, Mamoru; Shimoda, Kouzou; and Yoshida, Tomoe, 4,983,361, Cl. 422-145.000.

Nakamura, Tohru: *See*—
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, 4,984,048, Cl. 357-34.000.

Nakamura, Toshiyuki: *See*—
Kazami, Kazuyuki; Nakamura, Toshiyuki; and Wakabayashi, Hiroshi, 4,984,005, Cl. 354-412.000.

Nakamura, Yasuhiro: *See*—
Yamanaka, Hiroshi; and Nakamura, Yasuhiro, 4,983,231, Cl. 148-301.000.

Nakamura, Yasunari; Kuramochi, Kojiro; and Akashi, Teruo, to Toyota Jidosha Kabushiki Kaisha; and Aisin AW Co., Ltd. Method and apparatus for controlling 4-wheel drive system for a motor vehicle. 4,982,809, Cl. 180-248.000.

Nakamura, Yoshisada: *See*—
Ono, Shigetoshi; Kondo, Hirokazu; and Nakamura, Yoshisada, 4,983,506, Cl. 430-531.000.

Nakane, Shigeru: *See*—
Satoh, Yasuta; Nakane, Shigeru; and Yoneyama, Hitoshi, 4,983,890, Cl. 318-3.000.

Nakane, Toshio; Kageyama, Yukihiko; Konuma, Hiroaki; and Hijikata, Kenji, to Polyplastics Co., Ltd. Halogen-containing polyester resin composition and covered wire. 4,983,714, Cl. 528-272.000.

Nakanishi, Kiyoshi: *See*—
Takeda, Keiso; Kawai, Taiyo; Nakanishi, Kiyoshi; Ujihashi, Michiaki; and Takano, Yuichi, 4,982,716, Cl. 123-531.000.

Nakanishi Optical Corporation: *See*—
Sato, Shoichi, 4,983,029, Cl. 351-41.000.

Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, to Kyowa Hakko Kogyo Co., Ltd. Novel substances KS-504a, KS-504b, KS-504d and KS-504e and process for their preparation. 4,983,775, Cl. 568-446.000.

Nakano, Akio; and Takei, Hirosi, to Shin-Etsu Chemical Co., Ltd. Foamable silicone rubber composition and foamed silicone rubber body therefrom. 4,983,642, Cl. 521-88.000.

Nakano, Hiromitsu: *See*—
Oku, Hiroyuki; Yasohara, Masahiro; and Nakano, Hiromitsu, 4,983,894, Cl. 318-138.000.

Nakano, Kenji: *See*—
Takahashi, Takao; and Nakano, Kenji, 4,984,104, Cl. 360-77.140.

Nakano, Makoto: *See*—
Yanagihara, Takeshi; Honda, Tsugio; Nakano, Makoto; and Kajino, Hiroshi, 4,983,450, Cl. 428-283.000.

Nakano, Masaji, to NEC Corporation. CR-type oscillator circuit. 4,983,931, Cl. 331-111.000.

Nakano, Shinzo; and Nakajima, Masaru, to Yokohama Rubber Co., Ltd., The. Method of and apparatus for automatically winding adhesive ribbon-like material. 4,983,243, Cl. 156-192.000.

Nakano, Yoshifumi: *See*—
Ueno, Kouhei; Akagawa, Tomohiko; and Nakano, Yoshifumi, 4,983,647, Cl. 523-220.000.

Nakao, Haruki: *See*—
Mikiya, Toshio; and Nakao, Haruki, 4,982,461, Cl. 4-544.000.

Nakase, Kiyoshi: *See*—
Ishikawa, Masazumi; Osawa, Yasuhiko; Inaba, Hiroshi; Nakase, Kiyoshi; and Yanagida, Yukitoshi, 4,983,957, Cl. 340-785.000.

Nakashima, Kazushi: *See*—
Uno, Masaaki; Kobayashi, Masanori; and Nakashima, Kazushi, 4,983,548, Cl. 437-250.000.

Nakashima, Nakashima: *See*—
Hasegawa, Kenji; Nakashima, Nakashima; Eguchi, Toru; and Masako, Ota, 4,983,385, Cl. 424-78.000.

Nakata, Yoshihiro; and Kunishige, Tadao, to Sunstar Giken Kabushiki Kaisha. Blocked polyisocyanurate compound and plastisol composition containing same. 4,983,655, Cl. 524-101.000.

Nakaya, Shunsuke; Sano, Harunobu; and Kohno, Yoshiaki, to Murata Manufacturing Co., Ltd. Method of manufacturing monolithic ceramic capacitor. 4,982,485, Cl. 29-25.420.

Nakayama, Akira: *See*—
Nakamura, Eitaro; Yamakawa, Masahiro; Nakayama, Akira; and Takano, Fumio, 4,983,311, Cl. 252-62.540.

Nakayama, Toshimasa; Kohara, Hidekatsu; Aoyanagi, Naoki; and Hayashi, Daisuke, to Tokyo Ohka Kogyo Co., Ltd. Dyeing resistant insulation film of high quality for a color filter for use in a solid-state image pickup element. 4,983,020, Cl. 350-317.000.

Nakayama, Yoshiaki: *See*—
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,084, Cl. 398-209.000.
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,090, Cl. 358-229.000.

Nakayama, Yoshio: *See*—
Yamasaki, Kazuyuki; Yamamoto, Kimio; Watanabe, Masanobu; Kan, Kojiro; and Nakayama, Yoshio, 4,983,717, Cl. 528-317.000.

Nakayashiki, Susumu; Kashio, Jiro; Matsumura, Hisashi; Wada, Hiroyuki; Sako, Yoshihito; Matsuura, Fumiaki; and Kajiya, Ihei, to Hitachi, Ltd.; and Hitachi Software Engineering Co., Ltd. Method and apparatus for testing station address in network. 4,984,233, Cl. 370-16.000.

Nakazato, Masao: *See*—
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.

Nakazawa, Masashi: *See*—
Kinoshita, Mikio; Ohta, Wasaburo; and Nakazawa, Masashi, 4,982,696, Cl. 118-723.000.

Nakazawa, Ribun, to Teikoku Piston Ring Co., Ltd. Printing head for resistive ribbon type printing apparatus. 4,983,992, Cl. 346-76.0PH.

Nakazawa, Takeshi; Hashimoto, Jun; Nakamura, Shinichi; Yamazaki, Katsumi; Nakajima, Yoshihiro; Hayashi, Tsutomu; Ichikawa, Tetsuya; Yakigaya, Nobuyuki; Katahira, Kiyoshi; and Takeshima, Yoshinobu, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling automatic transmissions. 4,984,161, Cl. 364-424.100.

Nalco Chemical Company: *See*—
Kaesler, Ralph W.; and Fong, Dodd W., 4,983,686, Cl. 525-351.000.

Namba, Misako: *See*—
Sengoku, Koji; and Namba, Misako, 4,983,414, Cl. 426-634.000.

Nanba, Hirokuni: *See*—
Taguchi, Tsunemasa; and Nanba, Hirokuni, 4,983,249, Cl. 156-603.000.

Nardini, Renzo: *See*—
Cavalli, Luigi; and Nardini, Renzo, 4,983,557, Cl. 502-26.000.

Narishige, Shinji: *See*—
Komuro, Matahiro; Kozono, Yuzo; Narishige, Shinji; and Hanazono, Masanobu, 4,983,575, Cl. 505-001.000.

Narukawa, Yutaka: *See*—
Uehara, Katsuhiro; Ishii, Takahiko; Fujikawa, Takao; Kanda, Kuniaki; and Narukawa, Yutaka, 4,983,112, Cl. 425-136.000.

Naruse, Hideaki: *See*—
Takahashi, Osamu; Naruse, Hideaki; Morigaki, Masakazu; Ohki, Nobutaka; and Furutachi, Nobuo, 4,983,507, Cl. 430-551.000.

Naruse, Jun: *See*—
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,984,115, Cl. 360-106.000.

Naruse, Reizo: *See*—
Nakamura, Satoshi; Simizu, Teruo; Naruse, Reizo; and Igawa, Hiroyuki, 4,983,876, Cl. 310-328.000.

Nashiki, Masayuki; Matsui, Keiji; and Ieki, Atushi, to Kabushiki Kaisha Okuma Tekkosho. Linear encoder with plural detectors for use with one or more main scales. 4,983,900, Cl. 318-652.000.

Nasu, Atsushi. Ion water for production of foods and beverages. 4,983,409, Cl. 426-66.000.

National Research Council Canada: *See—*
Boothroyd, Simon A.; Chrostowski, Jacek; and O'Sullivan, Maurice S., 4,983,024, Cl. 350-354.000.

National Research Council of Canada/Conseil National de Recherches du Canada: *See—*
Jarlan, Gerard E., 4,982,681, Cl. 114-264.000.

National Research Development Corporation: *See—*
Sansome, Dennis H.; and Singer, Alfred R. E., 4,983,427, Cl. 427-347.000.

National Semiconductor Corporation: *See—*
Davis, Craig M.; and Tietz, Gary W., 4,984,255, Cl. 375-106.000.
Grebinski, Thomas J., Jr.; and Stephenson, Samuel H., 4,982,753, Cl. 134-95.000.
Perloff, Ronald S.; Hamstra, James R.; Li, Gabriel M.; and Yeung, Louise Y. Y., 4,984,251, Cl. 375-38.000.

National Starch and Chemical Investment Holding Corporation: *See—*
Tsai, John J.; Jobe, Patrick G.; Lamb, Diane J.; Billmrs, Robert L.; and Tessler, Martin M., 4,983,748, Cl. 549-551.000.

Natsuume, Tadao: *See—*
Miki, Yoshiaki; Ueda, Tsunehisa; and Natsuume, Tadao, 4,983,441, Cl. 428-65.000.

Nattermann, Kurt, to Schott Glaswerke. Bundle of optical fibers for transmission of electromagnetic radiation of high luminous intensity. 4,983,014, Cl. 350-96.240.

Naudin, Jacky: *See—*
Despres, Dominique; Naudin, Jacky; and Paquin, Jacques, 4,983,142, Cl. 464-68.000.

Nayar, Rajiv: *See—*
Schroit, Alan J.; and Nayar, Rajiv, 4,983,397, Cl. 424-450.000.

NCR Corporation: *See—*
Milne, Douglas L., 4,982,947, Cl. 271-263.000.

Nebraska Department of Economic Development: *See—*
Wagner, Frederick W.; Dean, Maria A.; de la Motte, Rebecca S.; and Stryker, Virginia H., 4,983,731, Cl. 536-127.000.

NEC Corporation: *See—*
Gokan, Hiroshi; Mukainaru, Masahito; Suzuki, Masayoshi; Tsuge, Hisanao; and Matsuya, Hidehiko, 4,983,545, Cl. 437-228.000.
Hanatani, Syuichi; Akagi, Masanobu; Nigo, Kouemon; Sugaya, Ritsuo; and Shibuya, Toshiteru, 4,984,154, Cl. 364-200.000.
Iwahashi, Koji, 4,983,904, Cl. 320-15.000.
Katori, Shigetatsu; Maehashi, Yukio; and Misawa, Yukari, 4,984,190, Cl. 364-900.000.
Kikuta, Kuniko, 4,983,534, Cl. 437-31.000.
Kobayashi, Masaharu, 4,984,050, Cl. 357-41.000.
Komuro, Sintaro; Nitta, Yasushi; and Hatanaka, Ryuichi, 4,983,989, Cl. 346-1.100.
Koyama, Tetsu, 4,984,250, Cl. 375-36.000.
Manome, Kaoru, 4,984,297, Cl. 455-619.000.
Morimoto, Hideaki, 4,984,252, Cl. 375-38.000.
Nakano, Masaji, 4,983,931, Cl. 331-111.000.
Neki, Katsuhiko, 4,984,189, Cl. 364-900.000.
Nishimoto, Hiroshi, 4,983,006, Cl. 350-96.140.
Ohuchi, Mitsurou, 4,984,183, Cl. 364-521.000.
Sakagami, Takako, 4,984,197, Cl. 365-63.000.
Sugibayashi, Tadahiko, 4,984,205, Cl. 365-200.000.
Uematsu, Ryosuke, 4,982,692, Cl. 118-661.000.

Nedvidek, Francis J., to Polaroid Corporation. Autofocus system. 4,984,229, Cl. 369-44.240.

Nee, Robert M., to Polyguard Products Incorporated. Protective wrapping material. 4,983,449, Cl. 428-252.000.

Neel, Henri; and DeLannoy, Francis. Process for concentrating aqueous ethylene oxide solutions. 4,983,260, Cl. 203-14.000.

Neff, Gregor N. Aquatic net pen and method. 4,982,697, Cl. 119-3.000.

Nejezchleb, Vladimir: *See—*
Herger, Zoltan L.; and Nejezchleb, Vladimir, 4,984,106, Cl. 360-92.000.

Neki, Katsuhiko, to NEC Corporation. Digital data processing circuit equipped with full bit string reverse control circuit and shifter to perform full or partial bit string reverse operation and data shift operation. 4,984,189, Cl. 364-900.000.

Nelle, Gunther; Schmitt, Walter; Schopf, Reinhold; and Weiss, Josef, to Dr. Johannes Heidenhain GmbH. Position measuring device. 4,982,508, Cl. 33-702.000.

Nesathurai, Samuel A., to Serres Naturtek Greenhouses Inc. Method for sterilizing liquids by ultraviolet radiation. 4,983,307, Cl. 210-748.000.

Nestec S. A.: *See—*
Angeloz, Corinne; Huerlimann, Peter; Schmied, Rudolf; and Van Meir, Eugene, 4,982,880, Cl. 222-490.000.

Nestle S.A.: *See—*
Steppe, Dennis L.; and Haines, Stephen W., 4,983,160, Cl. 604-22.000.

Netto, Eduardo D. L. C. Envelope with closure and seal device. 4,983,047, Cl. 383-5.000.

Neuberg Company Limited: *See—*
Ogawa, Kenji, 4,983,103, Cl. 417-400.000.

Neukrichner, Ernst-Peter; and Schlogl, Dietmar, to Robert Bosch GmbH. Method and apparatus for determining a route between a starting point and a destination. 4,984,168, Cl. 364-449.000.

Neumann, Peter: *See—*
Stumpp, Michael; Neumann, Peter; and Eilingsfeld, Heinz, 4,983,773, Cl. 568-034.000.

New England Biolabs, Inc.: *See—*
Barsomian, Janet M.; and Wilson, Geoffrey G., 4,983,522, Cl. 435-172.300.
Van Cott, Elizabeth M.; and Wilson, Geoffrey G., 4,983,542, Cl. 435-172.300.

Newell, Chester W., to Newell Research Corporation. Belt drive for power transfer to cartridge. 4,982,911, Cl. 242-192.000.

Newell, Chester W.; and Bates, Arthur D., to Newell Research Corporation. Method for writing position-indicating markers on magnetic tape. 4,983,496, Cl. 430-270.000.

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Newell, Chester W., 4,982,911, Cl. 242-192.000.
Newell, Chester W.; and Bates, Arthur D., 4,983,496, Cl. 430-270.000.

Newhart, Scott G.: *See—*
Coleman, Angus C.; and Newhart, Scott G., 4,983,120, Cl. 433-24.000.

Newland, David E.: *See—*
Cebon, David; Cole, David J.; Hardy, Michael S. A.; and Newland, David E., 4,984,128, Cl. 361-283.000.

NGK Insulators, Ltd.: *See—*
Kato, Nobuhide; and Katsu, Masanori, 4,983,271, Cl. 204-426.000.
Oda, Isao, 4,983,468, Cl. 428-621.000.
Seike, Shoji; Oguri, Noriyasu; Harada, Hiroshi; and Ishikawa, Junichi, 4,983,556, Cl. 501-143.000.
Yoshikawa, Akira; and Takeuchi, Tsunezo, 4,982,939, Cl. 269-32.000.

Nguyen, Dat: *See—*
Johnson, Gerald E.; and Nguyen, Dat, 4,982,829, Cl. 198-337.000.

Nguyen, Truong-Thao; and Thomas, Francois R., to Thomson Composants Microondes. Parallel analog-digital converter with error-correction circuit. 4,983,968, Cl. 341-118.000.

NHK Spring Co., Ltd.: *See—*
Ojima, Juji, 4,983,144, Cl. 474-111.000.

Nibbelink, Donald W.: *See—*
Dempski, Robert E.; Scholtz, Edward C.; Nibbelink, Donald W.; and Reines, Scott A., 4,983,400, Cl. 424-469.000.

Nicolson, Robert J.; and Jape, Anthony, to Figgie International Inc. Sortation conveyor. 4,982,828, Cl. 198-365.000.

Niemann, Klaus: *See—*
Merz, Ludwig; Niemann, Klaus; and Wenning, Hans-Peter, 4,983,782, Cl. 585-240.000.

Nieuwkoop, Anthony J.: *See—*
Stacey, Gary; Schell, Maria G.; Nieuwkoop, Anthony J.; Deshmane, Nirupama A.; and Banfalvi, Zsofia, 4,983,519, Cl. 435-172.300.

Nigalaye, Ashok: *See—*
Gaylord, Norman G.; and Nigalaye, Ashok, 4,983,398, Cl. 424-465.000.

Nigam, Anil K., to Fujitsu America, Inc. Method for reading/writing for a floppy disc drive with buffer memory. 4,984,103, Cl. 360-074.100.

Nigo, Kouemon: *See—*
Hanatani, Syuichi; Akagi, Masanobu; Nigo, Kouemon; Sugaya, Ritsuo; and Shibuya, Toshiteru, 4,984,154, Cl. 364-200.000.

Nigrelli, Biagio J., Sr., to Nigrelli System, Inc. Universal packer. 4,982,551, Cl. 53-55.000.

Nigrelli System, Inc.: *See—*
Nigrelli, Biagio J., Sr., 4,982,551, Cl. 53-55.000.

Nihei, Hideki: *See—*
Masaki, Ryoso; Kayama, Masahiro; Hayashida, Hiroshi; Nihei, Hideki; Katayama, Yasunori; Nagase, Hiroshi; Matsuda, Toshihiko; and Kamiyama, Kenzo, 4,983,875, Cl. 310-323.000.

Nihei, Ryo: *See—*
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,984,175, Cl. 364-513.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Tsukakoshi, Osamu; Sakurada, Yuzo; and Kashimoto, Kazuhiro, 4,983,850, Cl. 250-492.300.

Nihonkenkozoshinkenkyukai Co., Ltd.: *See—*
Masuda, Isamu; and Hayashi, Mitsuharu, 4,983,851, Cl. 250-493.100.

Niikura, Kanako: *See—*
Murakami, Yoshikazu; Ogihara, Takahiro; Okamoto, Tsutomu; and Niikura, Kanako, 4,983,936, Cl. 333-202.000.

Nijholt, Willem W.: *See—*
Puritch, George S.; Salloum, Gregory S.; and Nijholt, Willem W., 4,983,591, Cl. 514-65.000.

Nikkiso Co. Ltd.: *See—*
Yoshida, Masashi; Suzuki, Katsuhisa; and Yoshikawa, Masaaki, 4,983,293, Cl. 210-500.230.

Nikko Co., Ltd.: *See—*
Mikiya, Toshio; and Nakao, Haruki, 4,982,461, Cl. 4-544.000.

Nikon Corporation: *See—*
Kazami, Kazuyuki; Nakamura, Toshiyuki; and Wakabayashi, Hiroshi, 4,984,005, Cl. 354-412.000.
Takagi, Tadao, 4,984,007, Cl. 354-432.000.

Nilson, Nils B.: *See—*
Hook, Karl-Axel; Nilson, Nils B.; and Wellenstam, Kjell I., 4,983,164, Cl. 604-87.000.

Nilssen, Ole K. Controlled series-resonance-loaded ballast. 4,983,887, Cl. 315-224.000.

Nintendo Co., Ltd.: *See*—
Nakagawa, Katsuya, 4,984,193, Cl. 364-900.000.
Nippon Antenna Co., Ltd.: *See*—
Suga, Mitsuhiro; and Takizawa, Akio, 4,983,892, Cl. 318-98.000.
Nippon Keiki Works, Ltd.: *See*—
Nakamura, Satoshi; Simizu, Teruo; Naruse, Reizo; and Igawa, Hiroyuki, 4,983,876, Cl. 310-328.000.
Nippon Oil & Fats Co., Ltd.: *See*—
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,983,663, Cl. 524-504.000.
Nippon Paint Co., Ltd.: *See*—
Miwa, Hiroshi; Okude, Yoshitaka; Mizuguchi, Katsumi; and Okuda, Hidefumi, 4,983,715, Cl. 528-272.000.
Numata, Syuhei; Ohiwa, Masanori; Maekawa, Toshihiro; Kashihara, Akio; and Miyazono, Tadafumi, 4,983,671, Cl. 525-63.000.
Nippon Petrochemicals Co.: *See*—
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,983,663, Cl. 524-504.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, 4,982,804, Cl. 180-140.000.
Sekine, Hiroshi; Yamaguchi, Mikio; Sadakata, Kiyoshi; and Fukunaga, Yuichiro, 4,983,143, Cl. 464-89.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Yatagai, Hidetaka; Iriguchi, Jiro; Yamada, Souichi; and Takaya, Tsuguo, 4,983,710, Cl. 528-258.000.
Nippon Shokubai Kagaku Kogyo Kabushiki Kaisha: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Minami, Kenji; and Fukikawa, Iwao, 4,983,681, Cl. 525-290.000.
Nippon Soken, Inc.: *See*—
Huzino, Seizi; Mizuki, Shinya; Arai, Masumi; and Hattori, Tadashi, 4,983,469, Cl. 428-690.000.
Nippon Telegraph and Telephone Corporation: *See*—
Kumozaki, Kiyomi; Yamano, Seiichi; and Komiya, Ryoichi, 4,984,262, Cl. 379-5.000.
Nippon Zeon Co., Ltd.: *See*—
Miki, Yoshiaki; Ueda, Tsunehisa; and Natsuume, Tadao, 4,983,441, Cl. 428-65.000.
Nagata, Nobuo; and Hirokawa, Yoshitsugu, 4,982,465, Cl. 5-450.000.
Nakamura, Eitaro; Yamakawa, Masahiro; Nakayama, Akira; and Takano, Fumio, 4,983,311, Cl. 252-62.540.
Saito, Yoshiomi; Fujino, Akio; and Ikeda, Atsumi, 4,983,678, Cl. 525-193.000.
Nippondenso Co., Ltd.: *See*—
Munaoka, Yutaka, 4,984,075, Cl. 358-107.000.
Tani, Yatsuhiro; Ohmori, Susumu; and Komagata, Hideki, 4,983,193, Cl. 55-487.000.
Nishi, Kunihiko: *See*—
Yoshida, Isamu; Saeki, Junichi; Tsunoda, Shigeharu; Nishi, Kunihiko; and Mitani, Masao, 4,983,110, Cl. 425-116.000.
Nishida, Akihiro: *See*—
Nishise, Hideya; and Nishida, Akihiro, 4,984,026, Cl. 355-277.000.
Nishida, Fumihiko; and Yahata, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Vacuum contact type printing machine and method of contact therefor. 4,984,017, Cl. 355-91.000.
Nishida, Shinichi: *See*—
Takahashi, Toshihisa; Uchinami, Masanobu; Nishida, Shinichi; and Inoue, Hitoshi, 4,982,714, Cl. 123-488.000.
Nishida, Tetsuya: *See*—
Yasuoka, Hiroshi; Murase, Norio; Terao, Motoyasu; Nishida, Tetsuya; Andoo, Keikichi; and Ojima, Masahiro, 4,984,231, Cl. 369-275.100.
Nishida, Toshiro: *See*—
Yokota, Chitoshi; Kawano, Minoru; Sueyoshi, Masahiko; Nishida, Toshiro; Setoguchi, Shohachi; and Fujimoto, Akira, 4,982,984, Cl. 292-201.000.
Nishide, Hiroyuki: *See*—
Tsuchida, Eishun; Nishide, Hiroyuki; Yamamoto, Kimihisa; and Yoshida, Shu, 4,983,720, Cl. 528-373.000.
Nishijima, Hideo: *See*—
Okamoto, Kaneyuki; Nishijima, Hideo; Masuda, Michio; Ohtsubo, Hiroyasu; and Ono, Koichi, 4,984,083, Cl. 358-183.000.
Nishikawa, Hiroshi; and Inoue, Akinari, to Brother Kogyo Kabushiki Kaisha. Metronome for electronic instruments. 4,982,642, Cl. 84-484.000.
Nishikawa, Masaji, to Olympus Optical Co., Ltd. Rolled recording paper setting apparatus. 4,984,029, Cl. 355-310.000.
Nishikawa, Shigeru: *See*—
Hagino, Sadaaki; Suzuki, Motokazu; Nishikawa, Shigeru; and Hayashi, Kenichi, 4,983,576, Cl. 505-1.000.
Nishiki, Naomi: *See*—
Murakami, Mutsuaki; Yoshimura, Susumu; Nishiki, Naomi; Nakamura, Katsuyuki; and Watanabe, Kazuhiro, 4,983,244, Cl. 156-224.000.
Nishikizawa, Hidemaru: *See*—
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 4,983,802, Cl. 219-69.120.
Nishikori, Toshiaki: *See*—
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.
Nishimoto, Hiroshi, to NEC Corporation. Polarization-independent optical waveguide switch. 4,983,006, Cl. 350-96.140.
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, to Tokuyama Soda Kabushiki Kaisha. Process for preparation of perfluoro organic compounds. 4,983,747, Cl. 549-423.000.
Nishimura, Sadahiro: *See*—
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,983,663, Cl. 524-504.000.
Nishimura, Seiya: *See*—
Iijima, Kenzaburou; Hayashi, Yoshinori; and Nishimura, Seiya, 4,983,916, Cl. 324-207.210.
Nishimura, Tadashi: *See*—
Ishizu, Akira; Nishimura, Tadashi; and Inoue, Yasuo, 4,984,033, Cl. 357-17.000.
Nishimura, Yuji, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Assistant apparatus for fastening a webbing. 4,982,982, Cl. 280-808.000.
Nishino, Hiroyuki: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Nishino, Hiroyuki; and Sakaguchi, Jun, 4,983,633, Cl. 514-622.000.
Nishio, Hiroaki: *See*—
Sato, Michitaka; Watanabe, Keiji; and Nishio, Hiroaki, 4,983,368, Cl. 423-327.000.
Nishise, Hideya; and Nishida, Akihiro, to Minolta Camera Kabushiki Kaisha. Color image forming method. 4,984,026, Cl. 355-277.000.
Nishiura, Masaaki, to Kabushiki Kaisha Toshiba. Data latching for preheat and print control in a thermal printer. 4,983,054, Cl. 400-120.000.
Nishiwaki, Hiroshi, to Techno Roll Co., Ltd.; and Kawasaki Steel Corp. Apparatus for cleaning surface of sheet. 4,982,469, Cl. 15-3.000.
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Ohtsubo, Yoshinobu, to Zaidan Hozin Handotai Kenkyu Shinkokai; and Toyo Denki Seizo Kabushiki Kaisha. Static induction thyristor. 4,984,049, Cl. 357-38.000.
Nishizawa, Yukio; and Urata, Kazuo, to Victor Company of Japan, Ltd. Video IF signal detector. 4,984,080, Cl. 358-160.000.
Nissan Chemical Industries Ltd.: *See*—
Miyajima, Masaharu; Yamaguchi, Yukiya; Tsunematsu, Takao; and Oda, Toshihisa, 4,983,593, Cl. 514-110.000.
Nissan Motor Company, Ltd.: *See*—
Aida, Masahiro, 4,983,050, Cl. 384-99.000.
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu; Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, 4,982,979, Cl. 280-707.000.
Kawasaki, Akira, 4,982,978, Cl. 280-675.000.
Maeda, Ryoichi; Kadomukai, Yuzo; and Yamakado, Makoto, 4,982,707, Cl. 123-192.00B.
Maemura, Kenichiro, 4,984,137, Cl. 362-74.000.
Oota, Tadaki, 4,982,709, Cl. 123-339.000.
Sano, Akihiko, 4,982,621, Cl. 74-866.000.
Shimizu, Joji; Chujo, Yuji; Yamamoto, Yasushi; and Noda, You, 4,982,895, Cl. 237-2.00A.
Takeda, Yoshimitsu; Mochida, Haruo; Kanai, Toshio; and Masaki, Mikio, 4,982,584, Cl. 70-252.000.
Yamagishi, Hirofumi; Ohtsuka, Shigenobu; Kikuchi, Youichi; Isobe, Takayuki; and Mochizuki, Masato, 4,984,136, Cl. 362-66.000.
Nissei ASB Machine Co., Ltd.: *See*—
Koga, Kouhei, 4,983,116, Cl. 425-517.000.
Nisshin Engineering Co., Ltd.: *See*—
Murata, Hiroshi; and Yasuguchi, Masayuki, 4,983,046, Cl. 366-312.000.
Nisshin Flour Milling Co., Ltd.: *See*—
Murata, Hiroshi; and Yasuguchi, Masayuki, 4,983,046, Cl. 366-312.000.
Nitrokemia Ipartelepek: *See*—
Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, 4,983,764, Cl. 562-17.000.
Nitta, Yasushi: *See*—
Komuro, Sintaro; Nitta, Yasushi; and Hatanaka, Ryuichi, 4,983,989, Cl. 346-1.100.
Nitto Boseki Co., Ltd.: *See*—
Kuriowa, Katsumasa; Katayama, Katsuhiro; and Nagasawa, Takeshi, 4,983,756, Cl. 560-56.000.
NKK Corporation: *See*—
Matoba, Yuji; and Koshihara, Toshio, 4,983,836, Cl. 250-330.000.
Mitao, Shinji; Tsuyama, Seishi; and Minakawa, Kuninori, 4,983,357, Cl. 420-418.000.
Sato, Michitaka; Watanabe, Keiji; and Nishio, Hiroaki, 4,983,368, Cl. 423-327.000.
Nobel Kemi AB: *See*—
Nyqvist, Jan-Olof; and Hafstrand, Anders, 4,983,235, Cl. 149-109.600.
Nochumson, Samuel: *See*—
Kirkpatrick, Francis H.; Guiseley, Kenneth; Provochee, Richard; and Nochumson, Samuel, 4,983,268, Cl. 204-182.800.
Noda, Yasushi: *See*—
Tsuyuguchi, Hiroshi; Noda, Yasushi; and Uehara, Keiji, 4,984,224, Cl. 369-013.000.

Noda, You: *See*—
Shimizu, Joji; Chujo, Yuji; Yamamoto, Yasushi; and Noda, You, 4,982,895, Cl. 237-2.00A.
Nogami, Kazutaka: *See*—
Sawada, Kazuhiro; Sakurai, Takayasu; and Nogami, Kazutaka, 4,984,208, Cl. 365-222.000.
Noguchi, Hidehiko: *See*—
Kashiwara, Ryohei; Kashiwara, Hideaki; Noguchi, Hidehiko; and Kashiwara, Takeaki, 4,983,877, Cl. 313-140.000.
Noguchi, Hiroyuki; and Springer, Cort, to Honda Giken Kogyo Kabushiki Kaisha. Method of installing gasket into automotive door handle. 4,982,492, Cl. 29-446.000.
Noguchi, Masahiro: *See*—
Tamura, Koji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 4,983,312, Cl. 252-67.000.
Noguchi, Matsusaburo: *See*—
Konishi, Hiroshi; Noguchi, Matsusaburo; Tadokoro, Joji; and Otaki, Noboru, 4,982,942, Cl. 271-119.000.
Noguchi, Yasuo: *See*—
Yagata, Kazuhiko; and Noguchi, Yasuo, 4,982,735, Cl. 128-204.230.
Noguchi, Yukio: *See*—
Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, 4,982,804, Cl. 180-140.000.
Nolan, Daniel E.; and Williams, Gregory E., to Corning Incorporated. Method of making fiber optic coupler with longitudinal protrusions. 4,983,195, Cl. 65-4.200.
Nolen, H. Eugene. Individual wastewater treatment plant. 4,983,285, Cl. 210-197.000.
Nolke, Gunter; Ketterer, Gunter; and Dyma, Horst, to Mannesmann Aktiengesellschaft. Device with read head for magnetically recorded information. 4,984,117, Cl. 360-124.000.
Nomura, Etsuzo; Takeuchi, Hirokasu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, to Brother Kogyo Kabushiki Kaisha. Pattern-matching sheet-joining machine. 4,982,677, Cl. 112-314.000.
Nomura, Hiroaki, to Brother Kogyo Kabushiki Kaisha. Swiveling type plastic working machine. 4,982,589, Cl. 72-67.000.
Nonini, Geremia; and Ruzza, Wogler D., to Danieli & C. Officine Meccaniche SpA. Multipurpose rod cooling line. 4,982,935, Cl. 266-106.000.
Nonn, Alain: *See*—
Desmurs, Jean-Roger; and Nonn, Alain, 4,983,781, Cl. 570-210.000.
Nordica S.p.A.: *See*—
Sartor, Mariano, 4,982,515, Cl. 36-117.000.
Nordson Corporation: *See*—
Miller, Scott R.; Raterman, John M.; and Ziecker, Roger A., 4,983,109, Cl. 425-7.000.
Saidman, Laurence B.; and Smith, James C., 4,983,424, Cl. 427-243.000.
Nordstrom, Agneta K.: *See*—
Maley, Derrick T.; and Nordstrom, Agneta K., 4,983,515, Cl. 435-29.000.
Noreen, Allen L.; Crissinger, Dean R.; Melbye, William L.; Rodgers, Eric G.; Sipinen, Alan J.; and Wood, Leigh F. Refastenable adhesive tape closure. 4,983,174, Cl. 604-389.000.
Norsk Proco A/S: *See*—
Berg, Johannes G.; and Smith-Johannsen, Robert, 4,983,342, Cl. 264-113.000.
Norsolor S.A.: *See*—
Badie, Paul; and Siebert, Jean-Marie, 4,983,682, Cl. 525-290.000.
North American Oil Company, Inc.: *See*—
Yudin, Cal, 4,983,314, Cl. 252-71.000.
North American Philips Corporation: *See*—
Brennesholtz, Matthew S.; and Patt, Paul J., 4,982,695, Cl. 118-729.000.
Cavallerano, Alan P.; Basile, Carlo; and Tsinberg, Mikhail, 4,984,067, Cl. 358-12.000.
Skinner, Kenneth R.; and Bingham, Joseph P., 4,984,078, Cl. 358-141.000.
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Gray, Warren E., 4,983,084, Cl. 411-311.000.
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Norton, Peter. Crash sensor with snap disk release mechanism for stabbing primer. 4,982,664, Cl. 102-272.000.
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Manns, William G.; Norwood, David A.; Weeks, Don J.; Sheng, Chyi N.; and Wood, Anthony B., 4,984,282, Cl. 382-8.000.
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Martinez, Edgar, 4,984,267, Cl. 379-413.000.
Shu, Joseph S., 4,984,097, Cl. 358-429.000.
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Yoneda, Masahiro; Hatanaka, Masahiro; Kohno, Yoshio; Satoh, Shinichi; Oda, Hidekazu; and Moriizumi, Koichi, 4,984,199, Cl. 365-149.000.
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Oda, Yoshiaki; Ikeda, Takaharu; and Yamachika, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing an optically active α-isopropyl-p-chlorophenylacetic acid. 4,983,758, Cl. 560-105.000.
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Odeco, Inc.: *See*—
Petty, Terry D.; Chabot, Luc G.; Costello, Carmon R.; and Song, Kun K., 4,983,073, Cl. 405-224.000.
Odenthal, Heinz F., to Ostma Maschinenbau GmbH. Apparatus for the packaging of paper stacks. 4,982,552, Cl. 53-207.000.
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Ogata, Akimitsu; Fujisaka, Hisato; Igarashi, Sadao; Nozu, Toshimitsu; Onozato, Katsura; Hirose, Masanobu; and Miwa, Katsuji, to Omron Tateisi Electronics Co. Signal transmission system and method. 4,983,976, Cl. 342-42.000.
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Hara, Yasuaki; Ogawa, Masahiko; and Kashida, Meguru, 4,983,701, Cl. 528-15.000.
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Ogihara, Takahiro: *See*—
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Ogino, Kazuo, to Hoya Corporation. Glass melting method and apparatus. 4,983,198, Cl. 65-32.500.
Oguri, Noriyasu: *See*—
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Ohatake, Norio: *See—*
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Ohba, Toshihiro: *See—*
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Ohbayashi, Keiji; Komamura, Tawara; Goto, Sohei; and Ohya, Hidenobu, to Konica Corporation. Heat developing photosensitive material. 4,983,502, Cl. 430-353.000.

Ohgushi, Katsunori; Hijiri, Masao; and Kitazawa, Zenwemon, to Toray Industries, Inc. Fibrous heating element. 4,983,814, Cl. 219-545.000.

Ohi Seisakusho Co., Ltd.: *See—*
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Ohiwa, Masanori: *See—*
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Ohkaji, Hiroyuki; Matsuda, Itaru; and Yanagida, Masato, to Ricoh Company, Ltd. Image transfer unit for image recording apparatus. 4,984,024, Cl. 355-273.000.

Ohki, Hiroshi; Miyake, Ryo; Yamazaki, Isao; and Takahata, Fujiya, to Hitachi, Ltd. Sheath flow type flow-cell device. 4,983,038, Cl. 356-246.000.

Ohki, Naoyuki: *See—*
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Ohki, Nobutaka: *See—*
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Ohmi, Tadahiro: *See—*
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Ohtsubo, Yoshinobu, 4,984,049, Cl. 357-38.000.

Ohmori, Masashi: *See—*
Hashimoto, Takayoshi; Shibata, Masanori; Okimoto, Haruo; Tashima, Seiji; Yamada, Kaoru; Akagi, Toshimichi; Shimizu, Ritsuharu; Yamamoto, Masaru; and Ohmori, Masashi, 4,982,567, Cl. 60-600.000.

Ohmori, Susumu: *See—*
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Ohno, Akihiko: *See—*
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Ohshima, Shigeo: *See—*
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Ohta, Kenji; Horikoshi, Shigeru; and Sugawara, Hayato, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co. Electronic throttle valve opening control method and system therefor. 4,982,710, Cl. 123-399.000.

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Ohtani, Tamio: *See—*
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Ohtsubo, Hiroyasu: *See—*
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Ohtsubo, Yoshinobu: *See—*
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Ohtsuka, Kiyoto: *See—*
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Ohtsuka, Shigenobu: *See—*
Yamagishi, Hirofumi; Ohtsuka, Shigenobu; Kikuchi, Youichi; Isobe, Takayuki; and Mochizuki, Masato, 4,984,136, Cl. 362-66.000.

Ohuchi, Mitsurou, to NEC Corporation. Graphics display controller for transferring figure data to overlapping portions of destination area and drawing-enable area defined by clipping rectangle. 4,984,183, Cl. 364-521.000.

Ohuchida, Shuichi: *See—*
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Ohya, Hidenobu: *See—*
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Ohya, Hitoshi: *See—*
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Oishi, Yoshihiro; and Tanaka, Nobue, to Pola Chemical Industries, Inc. Compact case. 4,982,751, Cl. 132-299.000.

Ojakaar, Leo, to Du Pont de Nemours, E. I., and Company. Cured perfluoroelastomers and their preparation. 4,983,680, Cl. 525-281.000.

Ojima, Juji, to NHK Spring Co., Ltd. Belt or chain tensioner. 4,983,144, Cl. 474-111.000.

Ojima, Masahiro: *See—*
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Oka, Hideki: *See—*
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Okada, Naoya: *See—*
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Okamoto, Masamitsu; Wada, Masami; Funikawa, Hidenori; Kato, Haruo; and Shouji, Hideaki, to Chisso Corporation. Process for producing a carrier tape. 4,982,495, Cl. 29-846.000.

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Okamura, Masatomo, to Kabushiki Kaisha Toshiba. Circuit for displaying picture of multiple channels. 4,984,082, Cl. 358-183.000.

Okano, Kanemichi: *See—*
Fukaya, Chikara; Yasuda, Hitoshi; Akira, Toshiaki; Iwai, Masakazu; Okano, Kanemichi; and Yokoyama, Kazumasa, 4,983,584, Cl. 514-54.000.
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Oki Electric Industry Co., Inc.: *See—*
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Oki Electric Industry Co., Ltd.: *See—*
Konishi, Hiroshi; Noguchi, Matsusaburo; Tadokoro, Joji; and Otaki, Noboru, 4,982,942, Cl. 271-119.000.

Okimoto, Haruo: *See—*
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Okino, Yoshiharu, to Fuji Photo Film Co., Ltd. Exposure method and apparatus. 4,984,015, Cl. 355-68.000.

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Oklejas, Robert A.; and Oklejas, Eli, Jr. Power recovery pump turbine. 4,983,305, Cl. 210-642.000.

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Okuda, Hidefumi: *See—*
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Okuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition system for an engine with a reverse-rotation preventing function. 4,982,717, Cl. 123-603.000.

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Okude, Yoshitaka: *See—*
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Okumoto, Yoshinao: *See—*
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Okumura, Mitsunao, to Murata Manufacturing Co., Ltd. Noise filter. 4,983,934, Cl. 333-184.000.

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ductive layers and manufacturing method therefor. 4,984,055, Cl. 357-54.000.

Okuno, Yoshihide: *See*—
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O'Lenich, Anthony J., Jr. N-alkoxlated ether 2-pyrrolidones as conditioning agents. 4,983,384, Cl. 424-70.000.

Olin Corporation: *See*—
Geiger, Jon R.; Carney, Jayne F.; and Roberts, Katherine P., 4,983,511, Cl. 435-6.000.
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O'Loughlin, Mark E.: *See*—
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Olschewski, Armin: *See*—
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Effland, Richard C.; Klein, Joseph T.; Davis, Larry; and Olsen, Gordon E., 4,983,608, Cl. 514-256.000.
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Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.
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Watanabe, Youji; Kobayashi, Yoshiaki; and Satoh, Kazuhiro, 4,984,000, Cl. 354-195.100.

O'Malley, Gerard J.; Allen, Richard C.; and White, John I., to Hoechst-Roussel Pharmaceuticals Inc. Hexahydropyrrolo(2,3-B)indole carbamates, ureas, amides and related compounds. 4,983,616, Cl. 514-339.000.

OMI International Corporation: *See*—
Verhoeven, Peter, 4,983,262, Cl. 204-38.400.

Omron Tataeisi Electronics Co.: *See*—
Hirahara, Kazuaki, 4,984,170, Cl. 364-464.010.

Omron Tateisi Electronics Co.: *See*—
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Onada, Fumiyuki: *See*—
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Ong, Beng S.; Murti, Dasarao K.; and Alexandru, Lupu, to Xerox Corporation. Photoconductive imaging members with polyurethane hole transporting layers. 4,983,482, Cl. 430-59.000.

Ono, Koichi: *See*—
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Ono, Michio: *See*—
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Ono Pharmaceutical Co., Ltd: *See*—
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Ono, Shigetoshi; Kondo, Hirokazu; and Nakamura, Yoshisada, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,983,506, Cl. 430-531.000.

Ono, Taisaburo: *See*—
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Onozato, Katsura: *See*—
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Ookuma, Toshiyuki: *See*—
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Ooms, Simon: *See*—
Bisgaard, Peter N.; and Ooms, Simon, 4,984,277, Cl. 381-69.200.

Oosumimoto, Hirosi: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Oosumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.

Oota, Tadaki, to Nissan Motor Company, Ltd. Apparatus for controlling the idling speed of engine operable on gasoline/alcohol fuel blend. 4,982,709, Cl. 123-339.000.

Opalko, Albert: *See*—
Bradley, Gerald; Carr, Geoffrey P. R.; Opalko, Albert; and Yarwood, Richard J., 4,983,617, Cl. 514-341.000.

Oppor, Rick L.; and Braun, Timothy L., to Appliance Control Technology, Inc. Auxiliary electronic temperature control system for oven. 4,983,811, Cl. 219-497.000.

Oram, James W.; Hodson, Price R.; and Haake, Paul F., to Alnor Instrument Company. Air flow monitor and temperature compensating circuit therefor. 4,982,605, Cl. 73-204.190.

Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, to Nippon Petrochemicals Co.; and Nippon Oil & Fats Co., Ltd. Thermoplastic resin composition and method for preparing the same. 4,983,663, Cl. 524-504.000.

Orkin, Stanley S.; Carlson, Craig L.; and Rowlands, David B., to Kamatics Corporation. Method of making a flanged braided bearing. 4,983,240, Cl. 156-148.000.

Orlik, Ivo: *See*—
Humplik, Antonin; Benckova, Maria; Caucik, Pavol; Durmis, Julius; Goghova, Marcela; Karvas, Milan; Orlik, Ivo; and Povazancova, Marta, 4,983,657, Cl. 524-120.000.

Ormat Turbines, Ltd.: *See*—
Bronicki, Lucien Y., 4,982,569, Cl. 60-698.000.

Oros, Gyula: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,983,207, Cl. 71-88.000.

Orthopedic Technology, Inc.: *See*—
Morris, John C., 4,982,732, Cl. 128-80.00C.

Osaka, Shuichi: *See*—
Masuda, Hisao; Fujimoto, Hitoshi; and Osaka, Shuichi, 4,982,728, Cl. 228-4.500.

Osamu, Nishimura: *See*—
Yukio, Fujisawa; Yasuaki, Itoh; Osamu, Nishimura; and Tomoko, Fujii, 4,983,520, Cl. 435-69.300.

Osawa, Akihiko: *See*—
Koshino, Yutaka; Baba, Yoshiro; Osawa, Akihiko; and Yanagiya, Satoshi, 4,984,052, Cl. 357-49.000.

Osawa, Yasuhiko: *See*—
Ishikawa, Masazumi; Osawa, Yasuhiko; Inaba, Hiroshi; Nakase, Kiyoshi; and Yanagida, Yukitoshi, 4,983,957, Cl. 340-785.000.

Osborn, Paul V., to Mobil Oil Corporation. Rotary cutting apparatus. 4,982,637, Cl. 83-346.000.

Oslowski, Hans-Josef: *See*—
Lawrenz, Dirk; Schupp, Hans; Schwerzel, Thomas; Oslowski, Hans-Josef; and Heimann, Ulrich, 4,983,704, Cl. 528-69.000.

Osmonics, Inc.: *See*—
Kingsford, Kenji A.; and Chan, Anthony K., 4,983,104, Cl. 417-473.000.

Ostma Maschinenbau GmbH: *See*—
Odenthal, Heinz F., 4,982,552, Cl. 53-207.000.

O'Sullivan, Maurice S.: *See*—
Boothroyd, Simon A.; Chrostowski, Jacek; and O'Sullivan, Maurice S., 4,983,024, Cl. 350-354.000.

Otagawa, Atsushi; and Okabe, Toshio, to Honda Giken Kogyo Kabushiki Kaisha; and Sankei Giken Kogyo Kabushiki Kaisha. Method for production of molding for vehicles. 4,982,486, Cl. 29-527.400.

Otaki, Noboru: *See*—
Konishi, Hiroshi; Noguchi, Matsusaburo; Tadokoro, Joji; and Otaki, Noboru, 4,982,942, Cl. 271-119.000.

Otani, Atsushi; Shirotori, Hidefumi; Morikawa, Nobuyuki; and Otani, Shunsuke, to Hitachi Seiki Co., Ltd. Claw unit with paired separably connected claw elements. 4,982,970, Cl. 279-123.000.

Otani, Shunsuke: *See*—
Otani, Atsushi; Shirotori, Hidefumi; Morikawa, Nobuyuki; and Otani, Shunsuke, 4,982,970, Cl. 279-123.000.

Otenbaker, Audrey L. Convertible article of jewelry. 4,982,580, Cl. 63-2.000.

Otis Elevator Company: *See*—
Doi, Kazuhiko; and Kito, Yasutami, 4,982,816, Cl. 187-119.000.
Johnson, Gerald E.; and Nguyen, Dat, 4,982,829, Cl. 198-337.000.

Otsuka Pharmaceutical: *See*—
Fujii, Setsuro, 4,983,609, Cl. 514-274.000.

Ouvrier-Buffet, Jean-Louis; and Ravetto, Michel, to Commissariat a l'Energie Atomique. Measuring system constituted by a radiation detection circuit, a reading circuit and a support such as a cryostat cold finger. 4,983,840, Cl. 250-352.000.

Overbeek, Gerardus C.; and Huets, Martinus P. J., to ICI Resins b.v. Polyurethane coating compositions. 4,983,662, Cl. 524-501.000.

Overfelt, Ruel A.; and Teubert, John A., to Vanderbilt University. Platinum-cobalt alloy permanent magnets of enhanced coercivity. 4,983,230, Cl. 148-300.000.

Owens-Illinois Plastic Products Inc.: *See*—
Krall, Thomas J.; and Myers, Robert A., 4,983,349, Cl. 264-509.000.

Oy Lohja AB: *See*—
Matikainen, Jukka, 4,982,537, Cl. 52-251.000.

O'Yang, Counde; Kurz, Walter; Walker, Keith A. M.; and Wu, Helen Y., to Syntex (U.S.A.) Inc. Novel 6-alkyl and 6.8-dialkylbicyclo(4.2.-0)octane derivatives. 4,983,627, Cl. 514-510.000.

Ozaki, Hiroji: *See—*
Okumura, Yoshinori; Fujii, Atsuhiro; Nagatomo, Masao; Ozaki, Hiroji; Wakamiya, Wataru; and Matsukawa, Takayuki, 4,984,055, Cl. 357-54.000.

Ozaki, Takao: *See—*
Yoda, Akira; Sato, Yoshimitu; and Ozaki, Takao, 4,984,004, Cl. 354-317.000.

P C U K Produits Chimiques Ugine Kuhlmann: *See—*
Bertocchio, Rene; Foulletier, Louis; and Lantz, Andre, 4,983,769, Cl. 564-96.000.

Pacific Monolithics: *See—*
Ho, Pang-Ting; and Moghe, Sanjay B., 4,983,865, Cl. 307-571.000.

Pagano, Daniel M., to Eastman Kodak Company. Film cartridge and method of assembling the same. 4,982,909, Cl. 242-71.200.

Page, Robert W. G meter. 4,983,953, Cl. 340-467.000.

Paich, Louis: *See—*
Shea, John J.; Sabol, Richard P.; Paich, Louis; Cheski, Ronald A.; Sanner, Kenneth W.; and Beatty, William E., Jr., 4,983,939, Cl. 335-42.000.

Palacio, Marc: *See—*
Boncoeur, Marcel; Lieven, Thierry; and Palacio, Marc, 4,983,339, Cl. 264-56.000.

Palaniappan, Rasappa; and Dhyanchand, John J., to Sundstrand Corporation. Fast current discharging switch for a variable reluctance motor drive. 4,983,902, Cl. 318-701.000.

Palermiti, Michael: *See—*
Rios, Arturo M.; and Palermiti, Michael, 4,983,846, Cl. 250-458.100.

Paley, Martyn N. J.: *See—*
Lampman, David A.; Paley, Martyn N. J.; and McNally, James M., 4,983,920, Cl. 324-309.000.

Pall Corporation: *See—*
Verrando, Marcel G.; White, Donald H.; Koslow, Evan E.; and Barkley, Phillip G., 4,983,190, Cl. 55-21.000.

Palm, Roland. Agent and method for external treatment of domestic animals. 4,983,631, Cl. 514-552.000.

Palmer, Douglas J., to SNE Enterprises, Inc. Extruded core sections for wood fenestration mounting frames and sashes. 4,982,530, Cl. 49-504.000.

Palmucci, Carl J.: *See—*
Black, Arthur G.; Mazzuca, John R.; Palmucci, Carl J.; and Rao, Surya K., 4,984,146, Cl. 363-44.000.

Palome, Elaine: *See—*
Li, May K.; McLaughlin, Donna; Palome, Elaine; and Kessler, Jack, 4,983,523, Cl. 435-173.000.

Palonen, Juhani, to Instrumentarium Corp. Method and apparatus for marking a film in an X-ray apparatus. 4,983,991, Cl. 346-33.0ME.

Pals, Jan A.: *See—*
Haisma, Jan; Michielsen, Theodorus M.; and Pals, Jan A., 4,983,251, Cl. 156-630.000.

Paly, Oleg I.: *See—*
Stepanenko, Alexandr V.; Vereschagin, Mikhail N.; Paly, Oleg I.; Sheleg, Valery K.; Kaptsevich, Vyacheslav M.; Gorunov, Valery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V., 4,982,780, Cl. 164-463.000.

Pan, Ju-Don T., to Microelectronics and Computer Technology. Method of laser patterning an electrical interconnect. 4,983,250, Cl. 156-628.000.

Panduit Corp.: *See—*
Caveney, Jack E.; Bulanda, John J.; and Wende, Russell E., 4,983,130, Cl. 439-407.000.

Panian, Thomas L.: *See—*
Luttmer, David J.; Panian, Thomas L.; Wixey, Barry D.; and Wilson, Raymond L., 4,982,509, Cl. 33-706.000.

Paone, Donald J.: *See—*
Mizusawa, Eugene A.; Paone, Donald J.; Casella, Tracey L.; Flores, Dorothy L.; Choy, Clement K.; Gerritsen, Jan; Heiskell, Ronald E.; Dewees, Thomas; and Ellgen, Jon L., 4,982,467, Cl. 8-158.000.

Papak, Don J. Animal tethering device. 4,982,701, Cl. 119-121.000.

Paquette, Michael S.: *See—*
Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 4,983,553, Cl. 501-96.000.

Paquin, Jacques: *See—*
Despres, Dominique; Naudin, Jacky; and Paquin, Jacques, 4,983,142, Cl. 464-68.000.

Parc, Guy: *See—*
Born, Maurice; Parc, Guy; and Toulhoat, Herve , 4,983,558, Cl. 502-31.000.

Pardini, Franco P., to CGE Compagnia Generale Elecltromeccanica S.p.A. Electric switch mechanism for relays and contactors. 4,983,788, Cl. 200-16.00R.

Parini, Ettore: *See—*
Giani, Roberto P.; Parini, Ettore; and Tonon, Giancarlo, 4,983,620, Cl. 514-395.000.

Park, Hae S.: *See—*
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.

Park, Sung K.: *See—*
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.

Parker, Dane K.: *See—*
Weinstein, Arthur H.; Colvin, Howard A.; and Parker, Dane K., 4,983,684, Cl. 525-329.100.

Parker Kinetic Designs, Inc.: *See—*
Weldon, James M., 4,984,131, Cl. 361-335.000.

Parker, Richard B.: *See—*
Ayres, James W.; Sandine, William E.; and Parker, Richard B., 4,983,406, Cl. 426-9.000.

Parker, Robert M.: *See—*
Knoedler, Roy E.; Parker, Robert M.; Au, William G.; and Gebhard, Albert W., 4,982,997, Cl. 297-296.000.

Parla, Anthony J.; and Tepper, Howard F., to International Business Machines Corporation. Solder interconnects for selective line coupling. 4,982,892, Cl. 228-180.100.

Parnell, Francis W., to Parnell Pharmaceuticals, Inc. Method and composition for treating xerostomia. 4,983,378, Cl. 424-48.000.

Parnell Pharmaceuticals, Inc.: *See—*
Parnell, Francis W., 4,983,378, Cl. 424-48.000.

Parr, William J.: *See—*
Franklin, Ralph; Parr, William J.; Fesman, Gerald; and Jacobs, Barry A., 4,983,320, Cl. 252-350.000.

Pasquiou, Jean-Yves: *See—*
Germain, Michel; Gillet, Bruno; and Pasquiou, Jean-Yves, 4,983,300, Cl. 210-634.000.

Pastor, Stephen D.: *See—*
Ravichandran, Ramanathan; and Pastor, Stephen D., 4,983,770, Cl. 564-300.000.

Patel, Dinesh C.: *See—*
Chang, Yunik; Patel, Dinesh C.; and Ebert, Charles D., 4,983,395, Cl. 424-448.000.

Patel, Mahendra S.: *See—*
Wong, Suk-Fun; Storm, David A.; and Patel, Mahendra S., 4,983,638, Cl. 518-714.000.

Patel, Tushar M.; and Berg, Richard E., to United Technologies Automotive Inc. Composite article and method of making same. 4,983,442, Cl. 428-74.000.

Patience, Donald; and Li, Felipe S., to Kendall Company, The. Surgical sponge. 4,983,173, Cl. 604-384.000.

Pati, Paul J.: *See—*
Brennesholtz, Matthew S.; and Patt, Paul J., 4,982,695, Cl. 118-729.000.

Paul De La Pena Limited: *See—*
Turner, Anthony P. F.; Hodges, Alan P.; Franklin, Ann; Ramsay, Graham; and Steel, Davina, 4,983,516, Cl. 435-34.000.

Paul Flum Ideas, Inc.: *See—*
Bidwell, Christopher C.; and Fowler, Dewalt W., 4,982,840, Cl. 206-223.000.
Flum, Paul L.; and Fowler, Dewalt W., 4,982,849, Cl. 211-59.200.

Paul, James L.: *See—*
Yang, Nan L.; Auerbach, Andrew; Pesce, Rose.; Broussard, Jerry A.; and Paul, James L., 4,983,708, Cl. 528-230.000.

Paulik, Ernst: *See—*
Dangschat, Rainer; and Paulik, Ernst, 4,984,145, Cl. 363-19.000.

Paulovic, Anton S.: *See—*
von Buren, Stefan; and Paulovic, Anton S., 4,983,117, Cl. 425-563.000.

PAZ Arzneimittel-Entwicklungsgesellschaft mbH: *See—*
Lukas, Helmut; Schuster, Otto; and Rau, Gunther, 4,983,765, Cl. 562-401.000.

Pearson, John: *See—*
Sewell, Robert G. S.; and Pearson, John, 4,982,665, Cl. 102-306.000.

Pearson, Norman R.: *See—*
Kleschick, William A.; Costales, Mark J.; Ehr, Robert J.; Gerwick, Ben C., III; Meikle, deceased; Richard W.; Meikle, Diane L., executrix; Monte, William T.; and Pearson, Norman R., 4,983,772, Cl. 564-442.000.

Peczkowski, Jurgen: *See—*
Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Konrad, Alfred, 4,982,902, Cl. 239-585.000.

Pedicone, John T.: *See—*
O'Donnell, Matthew; Engeler, William E.; Bloomer, John J.; and Pedicone, John T., 4,983,970, Cl. 341-122.000.

Peglion, Jean L.; Gargouil, Yves M.; and Vilaine, Jean P., to Adir et Compagnie. Process for 1,4-dihydropyridine compounds. 4,983,740, Cl. 546-321.000.

Pelletier, Pierre, to Hydro-Quebec. Method and system for interconnecting in quadrature two synchronous or asynchronous three-phase networks. 4,983,856, Cl. 307-20.000.

Peltonen, Esko J., to Tamglass Oy. Method and apparatus in a glass sheet bending furnace for preventing the deflection of mould wagon bearing rails. 4,983,201, Cl. 65-104.000.

Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, to Nitrokemia Ipartelepek. Process for preparing N-phosphonomethyl-glycine. 4,983,764, Cl. 562-17.000.

Penlon Limited: *See—*
Green, Alan C.; and Eeles, Richard, 4,982,734, Cl. 128-200.140.

Pennell, Marvin: *See—*
Davis, H. O.; and Pennell, Marvin, 4,983,422, Cl. 427-228.000.

Pennell, Phillip E.; Blackmore, John M.; and Allen, Mark D., to MDR Group, Inc. Viscoelastic fluid for use in surgery and other therapies and method of using same. 4,983,585, Cl. 514-57.000.

Perkins, Christopher M.: *See—*
Glogowski, Mark W.; Hartman, Frederick A.; Heinzman, Stephen W.; and Perkins, Christopher M., 4,983,315, Cl. 252-102.000.

Perloff, Ronald S.; Hamstra, James R.; Li, Gabriel M.; and Yeung, Louise Y. Y., to National Semiconductor Corporation. Method and apparatus for the synchronization of a cascaded multi-channel data transmission. 4,984,251, Cl. 375-38.000.

Perret, Michel: *See—*
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, 4,983,791, Cl. 200-148.00A.

Perry, Daniel C.: *See—*
Lichti, Robert, Sr.; Bernard, Clay, II; Perry, Daniel C.; and Lukken, Stanley H., 4,983,091, Cl. 414-331.000.

Pesce, Rose.: *See—*
Yang, Nan L.; Auerbach, Andrew; Pesce, Rose.; Broussard, Jerry A.; and Paul, James L., 4,983,708, Cl. 528-230.000.

Peters, Edward N.: *See—*
Fox, Daniel W.; Peters, Edward N.; Riding, Geoffrey H.; and Willard, G. Fred, 4,983,719, Cl. 528-339.000.

Peters, Horst: *See—*
Kress, Hans-Jurgen; Kauth, Heremann; Peters, Horst; Lindner, Christian; and Muller, Friedemann, 4,983,658, Cl. 524-141.000.

Petersen, Eric A.: *See—*
Jamison, Chris M.; and Petersen, Eric A., 4,982,903, Cl. 239-690.100.

Peterson, Francis C.; and Buss, Dennis, to Buell Industries, Inc. Die for manufacturing a fastener blank. 4,982,596, Cl. 72-467.000.

Peterson, Stephen C.; Brimhall, Owen D.; McLaughlin, Thomas J.; Baker, Charles D.; and Sparks, Sam L., to Technical Research Associates, Inc. Methods and apparatus for moving and separating materials exhibiting different physical properties. 4,983,189, Cl. 55-15.000.

Petit, Daniel: *See—*
Saltel, Claude; and Petit, Daniel, 4,982,454, Cl. 4-300.000.

Petit, Jean-Michel: *See—*
Chollet, Hugues; Maupu, Jean-Louis; and Petit, Jean-Michel, 4,982,671, Cl. 105-168.000.

Petrie, Brian C.; Druetzler, Thomas W.; and Harris, Rodney M., to Sherwin-Williams Company, The. Isocyanate functional polymers. 4,983,676, Cl. 525-107.000.

Petroleo Brasileiro S.A. -Petrobras: *See—*
Haag, Roberto B.; da Silva, Jaime C.; Abarca, Juan R. Q.; and do Coutto Filho, Odyr, 4,983,693, Cl. 526-124.000.

Petrolite Corporation: *See—*
Naiman, Michael I.; and Chang, James C., 4,983,186, Cl. 44-394.000.

Petrosky, Charles. Rotatable exercise device. 4,982,950, Cl. 272-67.000.

Pett, Manfred: *See—*
Karbachsch, Massoud; and Pett, Manfred, 4,983,288, Cl. 210-321.870.

Petterson, Tor H. Lead refill cartridge for mechanical pencil. 4,984,288, Cl. 401-86.000.

Pettersson, Bo: *See—*
Soderberg, Bo; Pettersson, Bo; Hocke, Ulf; and Naeve, Ambjorn, 4,982,504, Cl. 33-502.000.

Petty, Terry D.; Chabot, Luc G.; Costello, Carmon R.; and Song, Kun K., to Odeco, Inc. Column stabilized platform with improved heave motion. 4,983,073, Cl. 405-224.000.

Petzold, Werner P.; and Umlauf, William P., to Borg-Warner Corporation. Control system for controlling the line pressure in a continuously variable transmission. 4,982,822, Cl. 192-3.580.

Peynot, Michel: *See—*
Manoury, Philippe; Obitz, Daniel; Peynot, Michel; and Frost, Jonathan, 4,983,607, Cl. 514-253.000.

Pezzoli, Luigi; and Favini, Luigi, to Vamatex S.p.A. Wear indicator for weft gripper strap. 4,982,767, Cl. 139-449.000.

Pfiester, James R.; Baker, Frank K.; and Sivan, Richard D., to Motorola, Inc. MOS transistors using selective polysilicon deposition. 4,984,042, Cl. 357-23.900.

Phase Dynamics, Inc.: *See—*
Scott, Bentley N.; and Shortes, Samuel R., 4,983,123, Cl. 434-21.000.

Phelps, Craig H.: *See—*
Hunt, William C., III; and Phelps, Craig H., 4,982,790, Cl. 166-299.000.
Hunt, William C., III; and Phelps, Craig H., 4,982,791, Cl. 166-299.000.
Hunt, William C., III; and Phelps, Craig H., 4,982,792, Cl. 166-299.000.

Phillips, Gregory; and Langton, Douglas, to EMF Corporation. Slotted link side-to-side jogging apparatus. 4,982,941, Cl. 271-84.000.

Phillips, Terry J. Bicycle seat adapter. 4,983,063, Cl. 403-4.000.

Photon Dynamics, Inc.: *See—*
Henley, Francois J., 4,983,911, Cl. 324-158.00R.

Picker International, Inc.: *See—*
Lampman, David A.; Paley, Martyn N. J.; and McNally, James M., 4,983,920, Cl. 324-309.000.

Pickett, William H. Barrier structure. 4,982,535, Cl. 52-71.000.

Picone, Joseph W.: *See—*
Hemphill, Charles T.; and Picone, Joseph W., 4,984,178, Cl. 364-513.500.

Pierce, James M.: *See—*
Cohen, Robert S.; Pierce, James M.; and Kinsey, William H., 4,983,393, Cl. 424-430.000.

Piermattie, Virginia; and Brownell, George L., to Aristech Chemical Corporation. Thermosetting composition from maleimide, olefinic monomer and unsaturated polyester. 4,983,669, Cl. 525-47.000.

Pieroh, Ernst-Albrecht: *See—*
Buhmann, Ulrich; Hubl, Dieter; and Pieroh, Ernst-Albrecht, 4,983,755, Cl. 560-24.000.

Pierson, Marlin R. Itch reducer. 4,982,743, Cl. 128-800.000.

Pigford, James F., to Allied-Signal Inc. Cyclic brake disc overhaul technique and structure. 4,982,818, Cl. 188-73.100.

Pihlaja, Roger K.: *See—*
Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 4,983,553, Cl. 501-96.000.

Pike, Royden H.: *See—*
Kliman, Harvey L.; and Pike, Royden H., 4,984,181, Cl. 364-518.000.

Pinaud, Serge: *See—*
Connan, Jean-Louis; Huiban, Jean-Yves; and Pinaud, Serge, 4,984,265, Cl. 379-390.000.

Ping, David T., to Caterpillar Industrial Inc. Load lifting attachment. 4,983,094, Cl. 414-621.000.

Pinhas, Hanna: *See—*
Landa, Benzion; Lavon, Amiran; Pinhas, Hanna; and Adam, Yossi, 4,984,025, Cl. 355-274.000.

Pinson, Pierre: *See—*
Cabaret, Louis; Girard, Genevieve; Pinson, Pierre; and De Saxce, Thibaut, 4,984,246, Cl. 372-69.000.

Pioneer Electronic Corporation: *See—*
Ando, Hitoshi, 4,983,980, Cl. 342-357.000.
Fujimoto, Hideki, 4,983,919, Cl. 324-77.00E.
Kumasaka, Osamu, 4,983,815, Cl. 235-376.000.

Pires, Paul B., to Epilogics, Inc. Transmission ratio changing apparatus and method. 4,983,151, Cl. 475-170.000.

Pitzer, Ulrike; Laubach, Benno; and Franz, Gerhard, to Bayer Aktiengesellschaft. Silicon nitride powder of low oxygen content. 4,983,371, Cl. 423-344.000.

Plessey Company plc: *See—*
Chopping, Geoffrey; and Borland, Andrew K., 4,984,236, Cl. 370-100.100.

Plichta, Edward J.: *See—*
Slane, Steven M.; and Plichta, Edward J., 4,983,476, Cl. 429-197.000.

PLM AB: *See—*
Ingemann, Ole, deceased, 4,982,555, Cl. 53-405.000.

Ploog, Uwe, to Henkel Kommanditgesellschaft auf Aktien. Alkoxylation process using a catalyst composition containing esters of titanic acid and zirconic acid. 4,983,778, Cl. 568-618.000.

Plum Industrial Co., Ltd.: *See—*
Lai, Larry; Lai, Zong-Syh; and Lai, Der-Shen, 4,984,141, Cl. 362-187.000.

Pober, Richard L.; and Novich, Bruce E., to Ceramics Process Systems Corp. Centrifugation system using static layer. 4,983,157, Cl. 494-37.000.

Pocci, Silvano. Gauge for measuring both the depth and the diameter of a bore hole. 4,982,505, Cl. 33-542.000.

Pohl, Daniel P.: *See—*
Truskolaski, Bernard S.; and Pohl, Daniel P., 4,983,664, Cl. 524-514.000.

Pola Chemical Industries, Inc.: *See—*
Oishi, Yoshihiro; and Tanaka, Nobue, 4,982,751, Cl. 132-299.000.

Polaroid Corporation: *See—*
Nedvidek, Francis J., 4,984,229, Cl. 369-44.240.

Polialden Petroquimica S.A.: *See—*
Haag, Roberto B.; da Silva, Jaime C.; Abarca, Juan R. Q.; and do Coutto Filho, Odyr, 4,983,693, Cl. 526-124.000.

Pollock, Michael L.: *See—*
Deb, Sugato; Hovis, John C.; and Pollock, Michael L., 4,983,202, Cl. 65-104.000.

Polyguard Products Incorporated: *See—*
Nee, Robert M., 4,983,449, Cl. 428-252.000.

Polyplastics Co., Ltd.: *See—*
Hayashi, Noriyuki; Kageyama, Yukihiko; and Hijikata, Kenji, 4,983,713, Cl. 528-190.000.
Nakane, Toshio; Kageyama, Yukihiko; Konuma, Hiroaki; and Hijikata, Kenji, 4,983,714, Cl. 528-272.000.

Polysar Limited: *See—*
Loucks, Dennis A., 4,983,528, Cl. 436-141.000.

Pomero, Claude A. Process and devices for retaining vehicles on a highway. 4,982,931, Cl. 256-13.100.

Pomico International, Inc.: *See—*
Smith, Peter J., 4,982,544, Cl. 52-606.000.

Pomidor, Patricia: *See—*
Tsang, Tsze H.; Spadafora, Vincent J.; and Pomidor, Patricia, 4,983,589, Cl. 514-64.000.

Pomini Farrell S.p.A.: *See—*
Bonino, Stefano F. S.; and Cavero, Nicola B., 4,982,934, Cl. 266-105.000.

Ponjee, Johannes J.: *See—*
Wolfrum, Stefan M.; Ponjee, Johannes J.; and Van de Poel, Angela C. L., 4,983,420, Cl. 427-77.000.

Popad, Inc.: *See—*
Buntsis, Frank Y., 4,984,098, Cl. 360-12.000.

Popp, Wolfgang, to Licentia Patent-Verwaltungs-GmbH. System for connecting light waveguide buses and coaxial cable buses. 4,983,010, Cl. 350-96.200.

Potter & Brumfield, Inc.: *See—*
James, Gene L., 4,984,123, Cl. 361-26.000.

Potter, Terry A.: *See—*
Seneker, Stephen D.; Potter, Terry A.; and Dunlap, Kenneth L., 4,983,763, Cl. 560-352.000.

Potters Industries, Inc.: *See—*
Dejaiffe, Robert, 4,983,458, Cl. 428-402.000.

Goetz, Kenneth E.; Hagarman, James A.; and Giovene, Joseph P., Jr., 4,983,550, Cl. 501-33.000.

Pottick, Lorelle A.: *See*—
Willis, Carl L.; and Pottick, Lorelle A., 4,983,673, Cl. 525-92.000.

Pouli, Dirk: *See*—
Moeglich, Karl; and Pouli, Dirk, 4,983,267, Cl. 204-182.400.

Pourahmady, Nasser: *See*—
Lewis, Charles M.; and Pourahmady, Nasser, 4,983,705, Cl. 528-170.000.

Povazancova, Marta: *See*—
Humplik, Antonin; Benckova, Maria; Caucik, Pavol; Durmis, Julius; Goghova, Marcela; Karvas, Milan; Orlik, Ivo; and Povazancova, Marta, 4,983,657, Cl. 524-120.000.

Powerscreen International Limited: *See*—
Eriksson, Jan E., 4,983,280, Cl. 209-241.000.

Pozzi, Franco; and Carenzi, Angelo, to Zambon S.p.A. Cap, reservoir and dropper assembly for bottles. 4,982,875, Cl. 222-83.000.

PPG Industries, Inc.: *See*—
Dana, David E.; Lawton, Ernest L.; and Brodmann, George L., 4,983,699, Cl. 526-240.000.
Franz, Helmut; and Goodwin, George B., 4,983,459, Cl. 428-410.000.
Reese, Thomas J.; and Rayburn, David B., 4,983,200, Cl. 65-103.000.

Praeg, Walter F.: *See*—
Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,982,796, Cl. 164-467.000.

Prascak, Brian; and Erickson, Todd, to James River Corporation. Resealable enclosure. 4,982,845, Cl. 206-621.000.

Pratley Investments (Proprietary) Limited: *See*—
Copperthwaite, Richard G.; Themistocleous, Themistoclis; and Hutchings, Graham J., 4,983,560, Cl. 502-85.000.

Prato, Luigi: *See*—
Vottero-Fii., Alberto; and Prato, Luigi, 4,982,996, Cl. 297-194.000.

Prausnitz, Mark R.: *See*—
Murphy, Carolyn S.; and Prausnitz, Mark R., 4,983,377, Cl. 424-47.000.
Murphy, Carolyn S.; and Prausnitz, Mark R., 4,983,418, Cl. 424-47.000.

President and Fellows of Harvard College: *See*—
Antoniades, Harry N.; and Lynch, Samuel E., 4,983,581, Cl. 514-12.000.

Pressouyre, Gerard: *See*—
Bonnet, Jacques; and Pressouyre, Gerard, 4,983,799, Cl. 219-10.493.

Presto Lock, Inc.: *See*—
Wingert, Rudolf, 4,982,586, Cl. 70-312.000.

Preston, David M.; Walton, Erlen B.; Oliver, James L.; and Juriga, James A., to Eaton Corporation. Hydraulic pump and actuator for parallel auxiliary leaf spring. 4,982,972, Cl. 280-121.000.

Prewo, Karl M.: *See*—
Minford, Eric; Prewo, Karl M.; and Miller, Robert J., 4,983,463, Cl. 428-435.000.

Prime Fiber Corporation: *See*—
Maxham, John V., 4,983,258, Cl. 162-189.000.

Pringle, Fonald E.; and Morris, Arthur J., to Camco International Inc. Method of making a subsurface well safety valve. 4,983,803, Cl. 219-69.170.

Pringle, William. Shampoo dispensing container. 4,982,874, Cl. 222-78.000.

Proconics International, Inc.: *See*—
Foulke, Richard F.; and Lord, Steven M., 4,983.093, Cl. 414-416.000.

Procter & Gamble Company, The: *See*—
Glogowski, Mark W.; Hartman, Frederick A.; Heinzman, Stephen W.; and Perkins, Christopher M., 4,983,315, Cl. 252-102.000.
Maksimoski, Richard C.; and Murphy, Carolyn S., 4,983,383, Cl. 424-70.000.
Murphy, Carolyn S.; and Prausnitz, Mark R., 4,983,377, Cl. 424-47.000.
Murphy, Carolyn S.; and Prausnitz, Mark R., 4,983,418, Cl. 424-47.000.

Proctor, Robert H.; and Eichenlaub, Dennis P., to Murray Corporation. Air conditioner charging station with same refrigerant return and method. 4,982,576, Cl. 62-292.000.

Production Engineering Association: *See*—
Taguchi, Tsunemasa; and Nanba, Hirokuni, 4,983,249, Cl. 156-603.000.

Projahn, Ulrich, to Robert Bosch GmbH. Pilot burner for a device for burning solids in the exhaust gas of internal combustion engines. 4,982,565, Cl. 60-303.000.

Promper, Hans-Josef: *See*—
Kuster, Hans-Werner; Vanaschen, Luc; and Promper, Hans-Josef, 4,983,205, Cl. 65-290.000.

Propper Manufacturing Co., Inc.: *See*—
Hunsinger, Peter; and Zwarun, Andrew, 4,983,416, Cl. 427-2.000.

Provochee, Richard: *See*—
Kirkpatrick, Francis H.; Guiseley, Kenneth; Provochee, Richard; and Nochumson, Samuel, 4,983,268, Cl. 204-182.800.

Prukop, Gabriel, to Texaco Inc. Method of using urea as a sacrificial agent for surfactants in enhanced oil recovery. 4,982,789, Cl. 166-272.000.

Pruyne, Jerry R. Device for slowing the burning of a resting cigarette and for extinguishing a cigarette. 4,982,746, Cl. 131-235.100.

Przybysz, John X.; and Hamilton, Clark A., to Westinghouse Electric Corp. Josephson analog to digital converter for low-level signals. 4,983,971, Cl. 341-133.000.

Puhl, Larry: *See*—
Levine, Stephen N.; and Puhl, Larry, 4,984,290, Cl. 455-33.000.

Puhl, Larry C.: *See*—
Brown, Daniel P.; and Puhl, Larry C., 4,984,219, Cl. 380-39.000.

Pulido, Miguel L.; and Ayzaguer, Juan M., to Buckman Laboratories International, Inc. Combination of 2-(thiocyanomethylthio)benzothiazole and a trihalogenated phenol. 4,983,618, Cl. 514-367.000.

Pulyer, Yuly: *See*—
Foster, Elyena; and Pulyer, Yuly, 4,982,951, Cl. 272-70.000.

Puritch, George S.; Salloum, Gregory S.; and Nijholt, Willem W., to Safer, Ltd. Environmentally safe, broad spectrum insecticide. 4,983,591, Cl. 514-65.000.

Quagliato, Dominick; and Deininger, David D., to American Home Products Corporation. Antihypertensive benzopyran derivatives. 4,983,612, Cl. 513-300.000.

Quantex Corporation: *See*—
Lindmayer, Joseph; and Wrigley, Charles Y., 4,983,834, Cl. 250-327.200.

Quemere, Eric: *See*—
Chopin, Thierry; Quemere, Eric; Nortier, Patrice; Schuppiser, Jean-Luc; and Segaud, Christian, 4,983,563, Cl. 502-150.000.

Quiben Solla, Jose : *See*—
Lopez Quintela, Manuel A.; Rivas Rey, Jose ; and Quiben Solla, Jose , 4,983,217, Cl. 75-739.000.

Quigley, M. Scott: *See*—
Davis, R. Michael; Sprunt, Eve S.; and Quigley, M. Scott, 4,982,604, Cl. 73-153.000.

R&D Association for Bioreactor System: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Aono, Koji; Doki, Ryoichi; Kuwazuru, Mamoru; Shimoda, Kouzou; and Yoshida, Tomoe, 4,983,361, Cl. 422-145.000.

Rabson, Thomas A.: *See*—
Wright, John V.; Rabson, Thomas A.; and Reifel, Michael D., 4,983,035, Cl. 356-32.000.

Radian Corporation: *See*—
Bell, Ronald D., 4,982,672, Cl. 110-346.000.

Radiation Dynamics, Inc.: *See*—
Thompson, Chester C.; Cleland, Marshall R.; and Lopez, Edward J., 4,983,849, Cl. 250-492.300.

Ragsdale, Frank D., Sr. Attaching means removal tool. 4,982,488, Cl. 29-263.000.

Rahn, Horst, to UNICOR GmbH Rahn Plastmaschinen. Method of producing an internally smooth, externally ribbed tube from extrudable plastic and apparatus for carrying out the method. 4,983,347, Cl. 264-508.000.

Rajaram, Babu; and Foster, Mark J., to Zenith Data Systems Corporation. Burst refresh of dynamic random access memory for personal computers. 4,984,209, Cl. 365-222.000.

Raman, Krishna; Cherukuri, Subraman R.; Mansukhani, Gul; and Faust, Steven M., to Warner-Lambert Company. Controlled release flavor system and method of preparation. 4,983,404, Cl. 426-3.000.

Ramani, Rajendrakumar N., to Five Star Idea, Inc. Instrument for cutting or gripping. 4,982,500, Cl. 30-254.000.

Ramos, Joel A.: *See*—
Rogers, Edward J.; Chabala, Leonard V.; and Ramos, Joel A., 4,983,792, Cl. 200-148.00F.

Ramsay, Graham: *See*—
Turner, Anthony P. F.; Hodges, Alan P.; Franklin, Ann; Ramsay, Graham; and Steel, Davina, 4,983,516, Cl. 435-34.000.

Rand, Robert W. Inductive heating process for use in causing necrosis of neoplasms at selective frequencies. 4,983,159, Cl. 600-9.000.

Rank Cintel Ltd.: *See*—
Mumford, Ronald W. J.; and Mead, Terence W., 4,984,086, Cl. 358-216.000.

Ransburg Corporation: *See*—
Jamison, Chris M.; and Petersen, Eric A., 4,982,903, Cl. 239-690.100.

Rao, A. Srinivasa; Arora, Om P.; and Aprigliano, Louis F., to United States of America, Navy. Method of producing $YBa_2Cu_3O_{6+x}$ superconductors with high transition temperatures. 4,983,571, Cl. 505-1.000.

Rao, Madhukar; Tomko, Richard F.; and Sayre, Daniel R., to Sherwin-Williams Company, The. Non-aqueous dispersions. 4,983,716, Cl. 528-272.000.

Rao, Surya K.: *See*—
Black, Arthur G.; Mazzuca, John R.; Palmucci, Carl J.; and Rao, Surya K., 4,984,146, Cl. 363-44.000.

Raschke, Josef: *See*—
Schuster, Rudolf; Raschke, Josef; and Kamperdicks, Klaus, 4,982,890, Cl. 228-44.700.

Rasser, Bernard: *See*—
Migeon, Henri-Noel; and Rasser, Bernard, 4,983,831, Cl. 250-309.000.

Raterman, John M.: *See*—
Miller, Scott R.; Raterman, John M.; and Ziecker, Roger A., 4,983,109, Cl. 425-7.000.

Ratzlaff, Marc H.: *See*—
Sutton, Fred A.; and Ratzlaff, Marc H., 4,982,521, Cl. 42-74.000.

Rau, Gunther: *See*—
Lukas, Helmut; Schuster, Otto; and Rau, Gunther, 4,983,765, Cl. 562-401.000.

Ravetto, Michel: *See*—
Ouvrier-Buffet, Jean-Louis; and Ravetto, Michel, 4,983,840, Cl. 250-352.000.

Ravichandran, Ramanathan; Schirmann, Peter J.; and Mar, Andrew, to Ciba-Geigy Corporation. Ethylenically unsaturated compounds

containing 1-hydrocarbyloxy-2,2,6,6-tetramethylpiperidine moieties, and polymers, copolymers and stabilized compositions. 4,983,737, Cl. 546-184.000.
Ravichandran, Ramanathan; and Pastor, Stephen D., to Ciba-Geigy Corporation. Substituted hydroxylamine ester stabilizers. 4,983,770, Cl. 564-300.000.
Rayburn, David B.: *See*—
Reese, Thomas J.; and Rayburn, David B., 4,983,200, Cl. 65-103.000.
Raychem Corporation: *See*—
Campbell, Bruce D.; and Zucker, Joseph, 4,983,008, Cl. 350-96.160.
Raytel Group Limited, The: *See*—
Hodgetts, John L.; and Hodson, Martin J., 4,983,963, Cl. 340-870.310.
Raytheon Company: *See*—
Adamski, Joseph R.; and Coates, Donald A., 4,982,606, Cl. 73-304.00C.
Bagdasarian, Samuel L., 4,983,667, Cl. 524-703.000.
Roberge, Raymond A., 4,983,982, Cl. 342-376.000.
RD Chemical Company: *See*—
Mombrun, Suzette L.; and Sedlak, Rudolf P., 4,983,224, Cl. 134-40.000.
Real, Peter; and Robertson, David H., to Analog Devices, Inc. Cascode current mirror. 4,983,929, Cl. 330-288.000.
Reamer, Marie T.: *See*—
Hertel, Larry W.; and Reamer, Marie T., 4,983,724, Cl. 536-4.100.
Reckinger, Arthur P., Jr.: *See*—
Casanova, Wayne J.; Reckinger, Arthur P., Jr.; Seyfert, Michael D.; Thorpe, James R.; and Wheeler, Stephen E., 4,984,133, Cl. 361-415.000.
Reddoch, Jeffrey A. Pipe wiper system. 4,982,787, Cl. 166-82.000.
Reed, Roland. Tennis racquet having a sandwich construction, vibration-dampening frame. 4,983,242, Cl. 156-172.000.
Reeder, David A.; Lopez, Carlos; and Burwick, Jack L, to GTE Products Corporation. Uniform coarse tungsten carbide powder and cemented tungsten carbide article and process for producing same. 4,983,354, Cl. 419-11.000.
Reeds, James A.: *See*—
McIlroy, M. Douglas; and Reeds, James A., 4,984,272, Cl. 380-25.000.
Reese, Thomas J.; and Rayburn, David B., to PPG Industries, Inc. Glass shaping ring having a thermal insulating member and method of shaping glass sheets using same. 4,983,200, Cl. 65-103.000.
Reeve, Michael H.: *See*—
James, Simon M; Davison, Mark; Hornung, Stephen; and Reeve, Michael H., 4,983,007, Cl. 350-96.150.
Regula, Michael: *See*—
Brunner, Matthias; Schmid, Ralf; and Regula, Michael, 4,983,833, Cl. 250-397.000.
Reica Corporation: *See*—
Taniguchi, Toru, 4,983,045, Cl. 366-117.000.
Reich, Hans J.: *See*—
Cohen, Gordon M.; and Reich, Hans J., 4,983,679, Cl. 525-194.000.
Reichner, Philip; and Dollard, Walter J., to Westinghouse Electric Corp. Electrochemical cell apparatus having axially distributed entry of a fuel-spent fuel mixture transverse to the cell lengths. 4,983,471, Cl. 429-19.000.
Reifel, Michael D.: *See*—
Wright, John V.; Rabson, Thomas A.; and Reifel, Michael D., 4,983,035, Cl. 356-32.000.
Reilly, Charles H. L.: *See*—
Barresi, Lawrence J.; and Reilly, Charles H. L., 4,983,348, Cl. 264-509.000.
Reines, Scott A.: *See*—
Dempski, Robert E.; Scholtz, Edward C.; Nibbelink, Donald W.; and Reines, Scott A., 4,983,400, Cl. 424-469.000.
Reiniche, Andre; and Sauvage, Philippe, to Compagnie Generale des Etablissements Michelin-Michelin & Cie. Process and apparatus for heat-treating carbon steel wires to obtain a fine pearlitic structure. 4,983,227, Cl. 148-128.000.
Reiton Ltd.: *See*—
Wright, John V.; Rabson, Thomas A.; and Reifel, Michael D., 4,983,035, Cl. 356-32.000.
Rembold, Helmut, to Robert Bosch GmbH. Valve control apparatus having a magnet valve for internal combustion engines. 4,982,706, Cl. 123-90.120.
Renishaw plc: *See*—
Stephens, William F. N., 4,983,828, Cl. 250-237.00G.
REOSC (SA Recherches et Etudes d'Optique et Sciences): *See*—
Derenne, Philippe; Louis, Michel; Camous, Jacques; and Tarreau, Michel, 4,983,028, Cl. 350-609.000.
Requejo, Luz P.; and Keyes, George B., to Drackett Company, The. All purpose cleaner concentrate composition. 4,983,317, Cl. 252-174.240.
Research Foundation of State University of New York, The: *See*—
Chu, Benjamin; and Dhadwal, Harbans S., 4,983,040, Cl. 356-338.000.
Rheinheimer, Joachim; Eicken, Karl; Theobald, Hans; Kuekenhoehner, Thomas; Westphalen, Karl-Otto; Wuerzer, Bruno; Frank, Juergen; and Meyer, Norbert, to BASF Aktiengesellschaft. Isoxazolines, their preparation and their use. 4,983,210, Cl. 71-94.000.
Rheinmetall GmbH: *See*—
Bender, Peter; and Rohrbeck, Heribert, 4,982,668, Cl. 102-495.000.
Bisping, Bernhard; Vagedes, Michael; and Kessler, Siegfried, 4,982,669, Cl. 102-520.000.
Koine, Richard, 4,982,649, Cl. 89-28.050.
Rhodes, Eugene E., to Ford Motor Company. Composite heat exchanger tube. 4,982,784, Cl. 165-109.100.
Rhone-Poulenc Chimie: *See*—
Bregeault, Jean-Marie; El-Ali, Bassam; and Martin, Jacques, 4,983,767, Cl. 562-528.000.
Chopin, Thierry; Quemere, Eric; Nortier, Patrice; Schuppiser, Jean-Luc; and Segaud, Christian, 4,983,563, Cl. 502-150.000.
Desmurs, Jean-Roger; and Nonn, Alain, 4,983,781, Cl. 570-210.000.
Rhone-Poulenc Chimie de Base: *See*—
Robin, Jean, 4,983,762, Cl. 560-335.000.
Rhone-Poulenc Sante: *See*—
Ardaillon, Pierre; and Bourrain, Paul, 4,983,403, Cl. 426-2.000.
Riach, Allan: *See*—
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Richards, Idwall C., to Jayrich Engineering PTY Ltd. Retractable arm/loader assembly. 4,983,092, Cl. 414-408.000.
Richardson, Brian E., to Morpheus Lights, Inc. Color filter changer. 4,984,143, Cl. 362-293.000.
Ricoh Company, Ltd.: *See*—
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,984,182, Cl. 364-519.000.
Himuro, Keiji, 4,984,001, Cl. 354-195.120.
Ide, Youji; and Kunitake, Tetsuji, 4,983,444, Cl. 428-195.000.
Isobe, Tami, 4,983,823, Cl. 250-225.000.
Iwata, Nobuo, 4,983,055, Cl. 400-144.200.
Kinoshita, Mikio; Ohta, Wasaburo; and Nakazawa, Masashi, 4,982,596, Cl. 118-723.000.
Mori, Takashi; and Sasaki, Eiichi, 4,983,994, Cl. 346-76.0PH.
Ohkaji, Hiroyuki; Matsuda, Itaru; and Yanagida, Masato, 4,984,024, Cl. 355-273.000.
Sakano, Yukio, 4,984,283, Cl. 382-28.000.
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Ricoh Corporation: *See*—
Chang, Hershow; Kim, Seong; and Motoyama, Tetsuro, 4,984,182, Cl. 364-519.000.
Riding, Geoffrey H.: *See*—
Fox, Daniel W.; Peters, Edward N.; Riding, Geoffrey H.; and Willard, G. Fred, 4,983,719, Cl. 528-339.000.
Ridoux, Claude, to Sanofi, Societe Anonyme. Granulated compositions of polysaccharides, process for their preparation and use. 4,983,583, Cl. 514-54.000.
Riedel, Josef: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedel, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 4,983,366, Cl. 423-240.000.
Rieder, Heinz; and Schwaiger, Max, to RSF-Elektronik Gesellschaft m.b.H. Length measuring system. 4,982,507, Cl. 33-702.000.
Riggins, Clifford H.; and Riggins, Terry L. Masonry block tool. 4,982,987, Cl. 294-62.000.
Riggins, Terry L.: *See*—
Riggins, Clifford H.; and Riggins, Terry L., 4,982,987, Cl. 294-62.000.
Rikagaku Kenkyusho Wako: *See*—
Takeuchi, Setsuo; and Kochi, Mutsuyuki, 4,983,636, Cl. 514-699.000.
Rimmer, Daniel P.: *See*—
Gregoli, Armand A.; Olah, Andrew M.; Hamshar, John A.; and Rimmer, Daniel P., 4,983,319, Cl. 252-314.000.
Rinderle, Heinz, to Telefunken Electronic GmbH. Controllable amplifier circuit. 4,983,928, Cl. 330-254.000.
Rinderle, Heinz, to Telefunken Electronic GmbH. Integrated circuit arrangement. 4,984,031, Cl. 357-13.000.
Rindone, Renato R.: *See*—
Huang, Der-Shing; and Rindone, Renato R., 4,983,734, Cl. 544-194.000.
Rios, Arturo M.; and Palermiti, Michael, to Arturo M. Rios. Portable fingerprint detection method and device. 4,983,846, Cl. 250-458.100.
Risdon Corporation: *See*—
Holloway, Thomas F., 4,983,059, Cl. 401-78.000.
Ritter, Sammie F.; and Caldwell, Stephen A., to Mobil Oil Corporation. Marine acoustic array configured for tow noise reduction. 4,984,218, Cl. 367-15.000.
Rittmann, Nancy C., to Snap-on Tools Corporation. Torque wrench with measurements independent of hand-hold position. 4,982,612, Cl. 73-862.230.
Rivas Rey, Jose : *See*—
Lopez Quintela, Manuel A.; Rivas Rey, Jose ; and Quiben Solla, Jose , 4,983,217, Cl. 75-739.000.
Robbins, Edward S., III. Bail type pitcher for thin walled container. 4,982,868, Cl. 220-404.000.
Robbins, Edward S., III. Pivoting handle type pitcher for thin walled container. 4,982,869, Cl. 220-404.000.
Roberge, Raymond A., to Raytheon Company. Space fed phased array antenna with dual phase shifter. 4,983,982, Cl. 342-376.000.
Robert Bosch GmbH: *See*—
Buisson, Dominique, 4,982,713, Cl. 123-467.000.
Gmelin, Karl, 4,982,711, Cl. 123-399.000.
Hans, Waldemar, 4,982,519, Cl. 40-666.000.
Holzgrefe, Volker, 4,982,901, Cl. 239-533.120.
Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Konrad, Alfred, 4,982,902, Cl. 239-585.000.
Neukrichner, Ernst-Peter; and Schlogl, Dietmar, 4,984,168, Cl. 364-449.000.
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Rembold, Helmut, 4,982,706, Cl. 123-90.120.
Stiefel, Hans-Peter; and Frank, Kurt, 4,982,602, Cl. 73-118.200.
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Roberts, Katherine P.: *See*—
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Roberts, Lincoln E.: *See*—
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Roberts, Victor D., to General Electric Company. Discharge lamp using acoustic resonant oscillations to ensure high efficiency. 4,983,889, Cl. 315-246.000.

Robertshaw Controls Company: *See*—
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Robertson, David H.: *See*—
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Robertson, George G.: *See*—
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 4,984,235, Cl. 370-60.000.

Robin, Jean, to Rhone-Poulenc Chimie de Base. Preparation of biureto polyisocyanates. 4,983,762, Cl. 560-335.000.

Robinson, Joseph R., to Bio-Mimetics, Inc.; and Columbia Laboratories, Inc. Bioadhesive compositions and methods of treatment therewith. 4,983,392, Cl. 424-427.000.

Robinson, Peter M.; and Van-Det, Nguyen, to Exxon Chemical Patents Inc. Cationic polymers. 4,983,698, Cl. 526-207.000.

Robud Company: *See*—
Kirkpatrick, Alan D., 4,982,639, Cl. 83-659.000.

Rock, Erich, to Julius Blum Gesellschaft m.b.H. Piece of furniture with at least one drawer. 4,983,000, Cl. 312-333.000.

Rockefeller University, The: *See*—
Ulrich, Peter C.; and Cerami, Anthony, 4,983,604, Cl. 514-238.500.

Rockwell International Corporation: *See*—
Cummings, Kathleen M.; and Hanson, Russell W., 4,984,293, Cl. 455-133.000.
Huston, Steven W., 4,983,954, Cl. 340-657.000.

Rode, Klaus; Mohr, Dieter; and Frass, Werner, to Hoechst Aktiengesellschaft. Photopolymerizable mixture and recording material produced therefrom. 4,983,498, Cl. 430-284.000.

Rode, Klaus: *See*—
Bongers, Bernd; Meurer, Rene; Oefner, Walter; Rode, Klaus; and Maier, Georg, 4,982,990, Cl. 295-21.000.

Rodgers, Eric G.: *See*—
Noreen, Allen L.; Crissinger, Dean R.; Melbye, William L.; Rodgers, Eric G.; Sipinen, Alan J.; and Wood, Leigh F., 4,983,174, Cl. 604-389.000.

Rodriguez, Nicolas. Dental floss device. 4,982,752, Cl. 132-327.000.

Roehrlein, Gerhard; and Seifert, Heinrich, to Siemens Aktiengesellschaft. Method for calibrating SQUID gradiometers of an arbitrary order. 4,983,912, Cl. 324-202.000.

Roess, Rudi: *See*—
Krause, Hans; Roess, Rudi; and Modlinski, Ulrich, 4,983,913, Cl. 324-204.000.

Roger, Pierre; Choay, Patrick; Monneret, Claude; and Fournier, Jean-Paul, to Sanofi S.A. Process for preparing nitrosourea derivatives. 4,983,726, Cl. 536-17.700.

Rogers, Edward J.; Chabala, Leonard V.; and Ramos, Joel A., to S&C Electric Company. Interrupter switch with selective circuit-isolating feature. 4,983,792, Cl. 200-148.00F.

Rogers, George: *See*—
Ernst, James J.; Williamson, Steven; Rogers, George; and Musto, Dominick J., 4,983,124, Cl. 434-226.000.

Rohm and Haas Company: *See*—
Jordan, Arthur D., Jr., 4,983,426, Cl. 427-407.100.

Rohrbeck, Heribert: *See*—
Bender, Peter; and Rohrbeck, Heribert, 4,982,668, Cl. 102-495.000.

Roinestad, Gerald C.: *See*—
Straight, Michael R.; and Roinestad, Gerald C., 4,982,833, Cl. 198-778.000.

Rokach, Joshua: *See*—
Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., 4,983,628, Cl. 514-510.000.

Roland, George R. Automatic illumination circuit. 4,983,883, Cl. 315-77.000.

Rolls-Royce plc: *See*—
Stewart, Peter A. E.; Skelton, Richard T.; Allen, Martin J.; and Douglas, Joseph, 4,983,841, Cl. 250-358.100.

Rondel, Stephen A.; and Carter, Joel R., to Advanced Products and Technologies, Inc. Voice language translator. 4,984,177, Cl. 364-513.500.

Rose, Ernst D. Mobile silo. 4,983,089, Cl. 414-276.000.

Ross, Robert S. Turret tool measuring device. 4,982,506, Cl. 33-626.000.

Rossi, Lothar. Device for determining the rotary angle position of rotary drives of electrical machines by evaluation of electrical voltages by sensors responding to rotary movements. 4,983,915, Cl. 324-207.170.

Rossigno, Louis P.; Gaiser, Robert F.; and Temple, Robert B., to Allied-Signal Inc. Adaptive braking system default activated proportioning valve. 4,982,999, Cl. 303-9.630.

Roth, Wolfgang: *See*—
Henkel, Hans-Joachim; Markert, Helmut; Roth, Wolfgang; and Kautek, Wolfgang, 4,983,419, Cl. 427-53.100.

Rothamel, Karl, to Hofmann Werkstatt-Technik GmbH. Method and circuit for stopping the test run of a rotor being balanced. 4,984,126, Cl. 361-144.000.

Rothen, Josef, to Macon Klebetechnik GmbH. Apparatus for applying glue to endless threads. 4,982,688, Cl. 118-420.000.

Rougee, Ann: *See*—
Saint Felix, Didier; Rougee, Ann; and Trousset, Yves, 4,984,160, Cl. 364-413.190.

Roush, Walter T., to Keystone International Inc. Valve seat tool for removing and inserting value seats. 4,982,483, Cl. 29-213.100.

Rouxhet, Paul G.: *See*—
Lardinois, Pierre F.; Rouxhet, Paul G.; Stone, William E. E.; Baker, Kenneth M.; and Baudichau, Alain E., 4,983,510, Cl. 435-4.000.

Rowe, David M., to British Gas plc. Process of manufacturing miniature thermoelectric converters. 4,983,225, Cl. 136-201.000.

Rowlands, Andrew S.: *See*—
Kidney, Paul D.; Rowlands, Andrew S.; and Mills, William P., 4,984,279, Cl. 382-1.000.

Rowlands, David B.: *See*—
Orkin, Stanley S.; Carlson, Craig L.; and Rowlands, David B., 4,983,240, Cl. 156-148.000.

Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James D.; and McCauley, Robert M., to Westinghouse Electric Corp. Apparatus for removing liquid from a composition and for storing the deliquified composition. 4,983,282, Cl. 210-95.000.

Roy, Donald W.; and Hastert, James L., to Coors Porcelain Company. Application of transparent polycrystalline body with high ultraviolet transmittance. 4,983,555, Cl. 501-120.000.

RSF-Elektronik Gesellschaft m.b.H.: *See*—
Rieder, Heinz; and Schwaiger, Max, 4,982,507, Cl. 33-702.000.

Rubey, Ulyss R., to Detectors, Inc. Directional shock detector. 4,982,684, Cl. 116-203.000.

Rubin, Mae K.: *See*—
McWilliams, John P.; and Rubin, Mae K., 4,983,275, Cl. 208-111.000.

Ruckert, Hans, to Hoechst Aktiengesellschaft. Positive-working radiation-sensitive composition and radiation-sensitive recording material prepared therewith. 4,983,501, Cl. 430-326.000.

Ruckle, Duane L.; Strangman, Thomas E.; and Keiser, Robert J., to Allied-Signal Inc. Diffusion bonding of titanium alloys with hydrogen-assisted phase transformation. 4,982,893, Cl. 228-220.000.

Rudell, Elliot; and Foster, George, to Rudell, Elliot. Water sprinkler mat game. 4,982,959, Cl. 273-1.0GE.

Rudi, Guttorm, to Tandberg Data AS. Magnetic tape recorder with capstan cassette transport. 4,984,111, Cl. 360-96.500.

Ruldolph, Udo: *See*—
Breuer, Siegfried; Delle, Heinz; and Ruldolph, Udo, 4,983,761, Cl. 560-217.000.

Ruscio, Dominic V.: *See*—
Hahn, Dennis; Johansson, Gary A.; Ruscio, Dominic V.; and Blank, Christopher E., 4,983,332, Cl. 264-1.100.

Ruzza, Wogler D.: *See*—
Nonini, Geremia; and Ruzza, Wogler D., 4,982,935, Cl. 266-106.000.

Ryoo, Ho G.: *See*—
Hyun, Il S.; Park, Hae S.; Choi, Chung G.; Ryoo, Ho G.; Koh, Jai O.; Kim, Sang I.; Park, Sung K.; Koo, Yung M.; Kim, Young I.; and Kim, Sea C., 4,983,546, Cl. 437-231.000.

Ryu, Dewey D. Y.: *See*—
Kim, Byung C.; and Ryu, Dewey D. Y., 4,983,517, Cl. 435-41.000.

S&C Electric Company: *See*—
Rogers, Edward J.; Chabala, Leonard V.; and Ramos, Joel A., 4,983,792, Cl. 200-148.00F.

S. C. Johnson & Son, Inc.: *See*—
Demarest, Scott W., 4,983,061, Cl. 401-148.000.

S. Szabo AG: *See*—
Szabo, Stephan L., 4,982,470, Cl. 15-104.00S.

S.T. Chemical Co., Ltd.: *See*—
Muneyuki, Ryonosuke; and Kanamaru, Hiroyuki, 4,983,391, Cl. 424-408.000.

Sasski, Elric W.; and Lawrence, Dale M., to MetriCor Inc. Optically resonant sensor with increased monotonic range. 4,983,824, Cl. 250-227.270.

Sabol, Richard P.: *See*—
Shea, John J.; Sabol, Richard P.; Paich, Louis; Cheski, Ronald A.; Sanner, Kenneth W.; and Beatty, William E., Jr., 4,983,939, Cl. 335-42.000.

Sachsenwerk Aktiengesellschaft: *See*—
Stegmuller, Karl, 4,983,793, Cl. 200-144.00B.

Sadakata, Kiyoshi: *See*—
Sekine, Hiroshi; Yamaguchi, Mikio; Sadakata, Kiyoshi; and Fukunaga, Yuichiro, 4,983,143, Cl. 464-89.000.

Saddle Vent, Inc.: *See*—
Gordon, Russell B.; Gordon, Jimmy A.; and Smith, Marion W., 4,982,653, Cl. 98-39.100.

Saeki, Junichi: *See*—
Yoshida, Isamu; Saeki, Junichi; Tsunoda, Shigeharu; Nishi, Kunihiko; and Mitani, Masao, 4,983,110, Cl. 425-116.000.

Safer, Ltd.: *See*—
Puritch, George S.; Salloum, Gregory S.; and Nijholt, Willem W., 4,983,591, Cl. 514-65.000.

Sagami Chemical Research Center: *See*—
Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,983,751, Cl. 558-272.000.

Sagan, Stephen F.: *See*—
Cooper, Erwin E.; Davis, Franklin L.; and Sagan, Stephen F., 4,983,837, Cl. 250-334.000.
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, to Hitachi, Ltd. Semiconductor device with buried side contact. 4,984,048, Cl. 357-34.000.
Sahota, Harvinder. Balloon catheters. 4,983,167, Cl. 606-194.000.
Saidman, Laurence B.; and Smith, James C., to Nordson Corporation. Method for forming a permanent foam coating by atomization onto a substrate. 4,983,424, Cl. 427-243.000.
Saijo, Yoshihiro; Arao, Takashi; and Yamane, Yoshitaka, to Shikoku Kokoki Co., Ltd. Apparatus for filling specified amount of liquid. 4,982,770, Cl. 141-258.000.
Saint Felix, Didier; Rougee, Ann; and Trousset, Yves, to General Elecrtric CGR SA. Method for image reconstruction through selection of object regions for imaging by a comparison of noise statistical measure. 4,984,160, Cl. 364-413.190.
Saint-Gobain Vitrage: *See*—
Daude, Gerard M.; and Bravet, Jean-Louis M., 4,983,461, Cl. 428-423.100.
Holzer, Gerhard; and Gelderie, Udo, 4,983,464, Cl. 428-442.000.
Saint-Gobain Vitrage International: *See*—
Kuster, Hans-Werner; Vanaschen, Luc; and Promper, Hans-Josef, 4,983,205, Cl. 65-290.000.
Saito, Hitoshi, to Fuji Photo Film Co., Ltd. Method of manufacturing a recording medium and recording medium. 4,983,439, Cl. 428-64.000.
Saito, Kazuhiko; Yokoyama, Kazuhiko; and Kimura, Yoshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Front fender for front-forked vehicles. 4,982,973, Cl. 280-152.100.
Saito, Kazuhito; Kakii, Toshiaki; Ishida, Hidetoshi; and Suzuki, Shuzo, to Sumitomo Electric Industries, Ltd. Optical fiber connector. 4,983,012, Cl. 350-96.210.
Saito, Keiya: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.
Saito, Kohichi: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.
Saito, Koichi: *See*—
Ikeda, Minoru; Saito, Koichi; and Kobayashi, Hideki, 4,983,440, Cl. 428-64.000.
Saito, Makoto: *See*—
Saitoh, Masao; Endo, Katsuhiko; Endoh, Yuzo; Kuroda, Takeshi; Saito, Makoto; and Shinkubo, Kenzo, 4,982,534, Cl. 52-63.000.
Saito, Masayoshi: *See*—
Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, 4,983,532, Cl. 437-31.000.
Saito, Mitsuo: *See*—
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.
Saito, Shiro; Kawamoto, Ryuichi; Kondo, Mineharu; and Sakakibara, Shigeru, to Inax Corporation. Apparatus for detecting certain substances in urine, a toilet stool and a system for collecting information on health. 4,982,741, Cl. 128-771.000.
Saito, Yoshiomi; Fujino, Akio; and Ikeda, Atsumi, to Nippon Zeon Co., Ltd. Curable rubber comopsition. 4,983,678, Cl. 525-193.000.
Saito, Yoshitake; and Hirooka, Kenji, to Olympus Opicals Co. Endoscope apparatus. 4,982,724, Cl. 128-4.000.
Saito, Yuichi, to Kabushiki Kaisha Toshiba. Portable computer having a battery voltage detecting circuit. 4,984,185, Cl. 364-707.000.
Saitoh, Hiroshi: *See*—
Fujimura, Katsunori; Saitoh, Hiroshi; and Matsumoto, Michio, 4,984,087, Cl. 358-225.000.
Saitoh, Masao; Endo, Katsuhiko; Endoh, Yuzo; Kuroda, Takeshi; Saito, Makoto; and Shinkubo, Kenzo, to Mitsui Construction Co., Ltd. Suspended membrane structure. 4,982,534, Cl. 52-63.000.
Saitoo, Osamu: *See*—
Saitoo, Ryuichi; Saitoo, Osamu; Ikeda, Takahide; Hirao, Mitsuru; and Hiraishi, Atsushi, 4,984,200, Cl. 365-154.000.
Saitoo, Ryuichi; Saitoo, Osamu; Ikeda, Takahide; Hirao, Mitsuru; and Hiraishi, Atsushi, to Hitachi, Ltd. Semiconductor circuit device having a plurality of SRAM type memory cell arrangement. 4,984,200, Cl. 365-154.000.
Sakagami, Seiji: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,983,825, Cl. 250-231.160.
Sakagami, Takako, to NEC Corporation. Semiconductor memory device having transfer gates coupled between bit line pairs and sense amplifier circuits. 4,984,197, Cl. 365-63.000.
Sakaguchi, Jun: *See*—
Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Ogawa, Nobuo; Nishino, Hiroyuki; and Sakaguchi, Jun, 4,983,633, Cl. 514-622.000.
Sakai, Yoshio: *See*—
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.
Sakakibara, Kenji; Akao, Michitoshi; Katoh, Tokunori; and Sawaki, Yukichi, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus. 4,984,011, Cl. 355-27.000.
Sakakibara, Kenji: *See*—
Makino, Kazumasa; Yoshihara, Hideo; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takeshi; Katoh, Tokunori; Morisaki, Hiroshi; Kobayashi, Masanari; and Asai, Shin, 4,984,009, Cl. 355-27.000.
Sakakibara, Shigeru: *See*—
Saito, Shiro; Kawamoto, Ryuichi; Kondo, Mineharu; and Sakakibara, Shigeru, 4,982,741, Cl. 128-771.000.
Sakamoto, Hideshi: *See*—
Daimon, Takashi; and Sakamoto, Hideshi, 4,983,452, Cl. 428-287.000.
Sakamoto, Hiroshi; Yamamoto, Mitsuru; and Ohya, Hitoshi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Multi-chamber inclined ball mill. 4,982,906, Cl. 241-179.000.
Sakamoto, Kenichiro: *See*—
Yamasaki, Katuhiko; Tanaka, Minoru; and Sakamoto, Kenichiro, 4,983,115, Cl. 425-228.000.
Sakamoto, Masafumi, to Japan Servo Co., Ltd. Hybrid-type stepping motor. 4,983,867, Cl. 310-49.00R.
Sakamoto, Shinichi; and Sonoda, Takuji, to Mitsubishi Denki Kabushiki Kaishi. Field effect transistor with multiple grooves. 4,984,036, Cl. 357-22.000.
Sakano, Shinji: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.
Sakano, Yukio, to Ricoh Company, Ltd. Two dimensional half-tone dot discrimination device. 4,984,283, Cl. 382-28.000.
Sakata, Tsuguhide: *See*—
Takayama, Makoto; Sakata, Tsuguhide; and Muramoto, Tomotaka, 4,984,095, Cl. 358-336.000.
Sakazume, Suehiro: *See*—
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,983,663, Cl. 524-504.000.
Sako, Shigeki, to Kabushiki Kaisha Toshiba. Hybrid resin-sealed semiconductor device. 4,984,065, Cl. 357-81.000.
Sako, Yoshihito: *See*—
Nakayashiki, Susumu; Kashio, Jiro; Matsumura, Hisashi; Wada, Hiroyuki; Sako, Yoshihito; Matsuura, Fumiaki; and Kajiya, Ihei, 4,984,233, Cl. 370-16.000.
Sakuma, Mikio: *See*—
Mizuno, Toshiaki; Kimura, Shinji; Sugiura, Toshiaki; Sakuma, Mikio; Sugimoto, Tasuku; and Imaizumi, Mamoru, 4,983,854, Cl. 250-561.000.
Sakurada, Yuzo: *See*—
Tsukakoshi, Osamu; Sakurada, Yuzo; and Kashimoto, Kazuhiro, 4,983,850, Cl. 250-492.300.
Sakurai, Akihiro; and Watanabe, Yutaka, to Hitachi, Ltd. Multilayer wiring substrate. 4,984,132, Cl. 361-414.000.
Sakurai, Takayasu: *See*—
Sawada, Kazuhiro; Sakurai, Takayasu; and Nogami, Kazutaka, 4,984,208, Cl. 365-222.000.
Salam, Hassan P. A., to Unisplay S.A. Display arrangement. 4,983,956, Cl. 340-783.000.
Salice, Luciano, to Arturo Salice S.p.A. Mounting plate for a furniture hinge or the like. 4,982,476, Cl. 16-382.000.
Salloum, Gregory S.: *See*—
Puritch, George S.; Salloum, Gregory S.; and Nijholt, Willem W., 4,983,591, Cl. 514-65.000.
Salomon, Salomon M., to Bird Machine Company, Inc. Screen bowl centrifuge. 4,983,289, Cl. 210-360.100.
Salomon S.A.: *See*—
Morell, Joseph, 4,982,964, Cl. 273-232.000.
Saltel, Claude; and Petit, Daniel, to Etablissements Porcher. Toilet system comprising a toilet bowl associated with a water flush tank. 4,982,454, Cl. 4-300.000.
Samarakone, Nandasiri: *See*—
Lee, Rosemary A.; Samarakone, Nandasiri; and Cade, Neil A., 4,983,878, Cl. 313-308.000.
Samsung Electronics Co., Ltd.: *See*—
Bae, Kisun; and Joo, Yunghoon, 4,983,903, Cl. 320-2.000.
Cho, Wonjung; and Choi, Kwangju, 4,984,223, Cl. 368-76.000.
Eun, Jin-Pyo, 4,984,263, Cl. 379-158.000.
Kim, Jin-Nam, 4,984,096, Cl. 358-342.000.
Yim, Hyung-Kyu; Choi, Jung-Dal; and Lee, Woong-Moo, 4,983,860, Cl. 307-443.000.
Sanden Corporation: *See*—
Susumu, Ikeda, 4,982,582, Cl. 62-115.000.
Sanders, Daniel W. Automobile window arm rest. 4,982,921, Cl. 248-118.000.
Sandine, William E.: *See*—
Ayres, James W.; Sandine, William E.; and Parker, Richard B., 4,983,406, Cl. 426-9.000.
Sandoval, Gregory J.: *See*—
Ho, Keese; Ferguson, Bruce R.; and Sandoval, Gregory J., 4,984,079, Cl. 358-160.000.
Sandrew, Barry B., to American Film Technologies, Inc. System and method for color image enhancement. 4,984,072, Cl. 358-81.000.
Sankei Giken Kogyo Kabushiki Kaisha: *See*—
Otagawa, Atsushi; and Okabe, Toshio, 4,982,486, Cl. 29-527.400.
Sankosha Corporation: *See*—
Uwano, Yukio, 4,984,125, Cl. 361-124.000.

Sanna, Frank, Jr., to Mobay Corporation. Polyurea elastomers with reduced brittleness. 4,983,643, Cl. 521-159.000.

Sanner, Kenneth W.: *See*—
Shea, John J.; Sabol, Richard P.; Paich, Louis; Cheski, Ronald A.; Sanner, Kenneth W.; and Beatty, William E., Jr., 4,983,939, Cl. 335-42.000.

Sannomiya, Kunio: *See*—
Ikegaya, Kazutoshi; Sannomiya, Kunio; Tsuda, Yukifumi; Maruyama, Yuji; Araki, Nobuhiro; and Toba, Hiroto, 4,983,827, Cl. 250-235.000.

Sano, Akihiko, to Nissan Motor Company, Limited. Line pressure control system for automatic transmission. 4,982,621, Cl. 74-866.000.

Sano, Harunobu: *See*—
Nakaya, Shunsuke; Sano, Harunobu; and Kohno, Yoshiaki, 4,982,485, Cl. 29-25.420.

Sano, Hiroshi: *See*—
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.

Sano, Hisumi: *See*—
Kanzawa, Ryosaku; Takahashi, Ken; Sano, Hisumi; and Kurata, Kazuhiro, 4,984,035, Cl. 357-17.000.

Sano, Tsutomu: *See*—
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.

Sano, Yoshiaki; Hanazawa, Toshio; Katagase, Yasuhide; Yasukouchi, Katsuyuki; Matsumoto, Takashi; and Fujihara, Susumu, to Fujitsu Limited; Fujitsu VLSI Limited; and Fujitsu Ten Limited. Constant voltage source circuit. 4,983,905, Cl. 323-274.000.

Sanofi, Societe Anonyme: *See*—
Ridoux, Claude, 4,983,583, Cl. 514-54.000.
Roger, Pierre; Choay, Patrick; Monneret, Claude; and Fournier, Jean-Paul, 4,983,726, Cl. 536-17.700.

Sansome, Dennis H.; and Singer, Alfred R. E., to National Research Development Corporation. Spray depositing of metals. 4,983,427, Cl. 427-347.000.

Santangelo, Francesco: *See*—
Casagrande, Cesare; and Santangelo, Francesco, 4,983,606, Cl. 514-248.000.

Sanwa Diamond Industrial Co., Ltd.: *See*—
Matsuda, Yusaku, 4,982,720, Cl. 125-15.000.

Sanyo Chemical Industries, Ltd.: *See*—
Gokan, Hiroshi; Mukainaru, Masahito; Suzuki, Masayoshi; Tsuge, Hisanao; and Matsuya, Hidehiko, 4,983,545, Cl. 437-228.000.

Sanyo Electric Co., Ltd.: *See*—
Ishikawa, Tsutomu, 4,983,858, Cl. 307-362.000.
Kaneko, Masato; Takagi, Minoru; Sunaga, Takashi; Komatsubara, Takeo; and Mutoh, Taira, 4,983,313, Cl. 252-68.000.
Takemura, Masakazu; Honda, Hironori; and Terasaka, Masayuki, 4,983,477, Cl. 429-222.000.
Tanno, Masaya, 4,983,863, Cl. 307-492.000.

Sanyo Turk Co., Ltd.: *See*—
Miyachi, Yoshifumi, 4,982,526, Cl. 47-56.000.

Sardee Corporation: *See*—
Chiappe, Wayne T.; and Gasquoine, Randy W., 4,983,095, Cl. 414-786.000.

Sargent, Leigh R. Fiber reinforced composite product having a hollow interior. 4,983,430, Cl. 428-34.100.

Sartor, Mariano, to Nordica S.p.A. Shell structure particularly for ski boots. 4,982,515, Cl. 36-117.000.

Sasaki, Eiichi: *See*—
Mori, Takashi; and Sasaki, Eiichi, 4,983,994, Cl. 346-76.0PH.

Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, to Fuji Photo Film Co., Ltd. Video camera. 4,984,084, Cl. 398-209.000.

Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, to Fuji Photo Film Co., Ltd. Tripod-containing grip for use with a video camera. 4,984,090, Cl. 358-229.000.

Sasaki, Kanemi; and Ogawa, Sadao, to Kokusai Electric Co., Ltd. Band-stop filter. 4,983,938, Cl. 333-207.000.

Sasaki, Kazuaki: *See*—
Yamamoto, Saburo; Morimoto, Taiji; Sasaki, Kazuaki; Kondo, Masaki; Suyama, Takahiro; and Kondo, Masafumi, 4,984,244, Cl. 372-461.000.

Sasaki, Morimasa: *See*—
Satoh, Takateru; Hashizume, Kenji; Sasaki, Morimasa; and Tanaka, Kimio, 4,984,120, Cl. 360-128.000.

Sasaki, Shigeo, to Monsanto Japan Limited. Fine polishing composition for wafers. 4,983,650, Cl. 524-27.000.

Sasaki, Toshio; Sogabe, Eiji; and Ebara, Takeshi, to Sumitomo Chemical Company, Limited. Process for producing solid catalyst for use in polymerization of olefins. 4,983,561, Cl. 502-107.000.

Sasaki, Toyonori: *See*—
Matsumoto, Jun-ichi; Sasaki, Toyonori; and Touma, Kiyoshi, 4,984,003, Cl. 354-235.100.

Sasaki, Yoshihiro: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, 4,983,127, Cl. 439-79.000.

Saskatchewan Power Corporation: *See*—
Davall, Peter W. N.; and Spencer, John D. (said Peter W. N. Davall assors. to), 4,983,853, Cl. 250-554.000.

Sassa, Robert L., to W. L. Gore & Associates, Inc. Filter laminates. 4,983,434, Cl. 428-36.200.

Sato, Isao: *See*—
Kikuchi, Shinichi; Iwahashi, Hiroshi; Kato, Hideo; and Sato, Isao, 4,983,861, Cl. 307-443.000.

Sato, Katsuyuki, to Hitachi, Ltd. Semiconductor memory. 4,984,217, Cl. 365-230.090.

Sato, Kazunao: *See*—
Kimura, Hiroshi; Sato, Kazunao; Matsumura, Mitsuie; and Hirai, Chika, 4,983,470, Cl. 429-16.000.

Sato, Koichi: *See*—
Matsumoto, Mitsuo; Ohtsuka, Kiyoto; Sato, Koichi; and Okaya, Takuji, 4,983,318, Cl. 252-299.010.

Sato, Masahiko: *See*—
Takayama, Norikazu; Ushijima, Nobuyoshi; Kobashi, Tetsuzo; Sato, Masahiko; Yano, Yoshihiko; Isozaki, Jun; Fujii, Kousuke; and Kudoh, Yoshinobu, 4,984,100, Cl. 360-49.000.

Sato, Michitaka; Watanabe, Keiji; and Nishio, Hiroaki, to NKK Corporation. Method of producing β-sialon fine powder. 4,983,368, Cl. 423-327.000.

Sato, Minoru: *See*—
Nagahashi, Toshio; Yamashita, Kiyoshi; and Sato, Minoru, 4,983,154, Cl. 493-315.000.

Sato, Mitsugu, to Hitachi, Ltd. Scanning electron microscope. 4,983,832, Cl. 250-310.000.

Sato, Mitsuhiko: *See*—
Aoshima, Masashi; Shigematu, Hironobu; and Sato, Mitsuhiko, 4,983,685, Cl. 525-331.800.

Sato, Shinya, to Sony Corporation. Tape cassette with air blocking baffles. 4,984,122, Cl. 360-132.000.

Sato, Shoichi, to Tokin Corporation; and Nakanishi Optical Corporation. Eyeglass frame having Ti-Ni-V alloy element with improved wear comfortability. 4,983,029, Cl. 351-41.000.

Sato, Tsunehiko: *See*—
Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, 4,982,687, Cl. 118-410.000.

Sato, Yasuhisa; and Motoyama, Takushi, to Fujitsu Limited. Method of manufacturing a semiconductor integrated circuit having an interconnection wire embedded in a protective layer covering the semiconductor integrated circuit. 4,983,543, Cl. 437-192.000.

Sato, Yoichi; and Mizukami, Masao, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor storage device with common data line structure. 4,984,201, Cl. 365-154.000.

Sato, Yoichi; Mizukami, Masao; and Ookuma, Toshiyuki, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. High speed sensor system using a level shift circuit. 4,984,204, Cl. 365-189.110.

Sato, Yoshimitu: *See*—
Yoda, Akira; Sato, Yoshimitu; and Ozaki, Takao, 4,984,004, Cl. 354-317.000.

Sato, Yukio, to Olympus Optical Co., Ltd. Endoscopic treating instrument. 4,982,727, Cl. 128-4.000.

Satoh, Isao; Fukushima, Yoshihisa; Takagi, Yuji; and Azumatani, Yasushi, to Matsushita Electric Industrial Co., Ltd. Rewritable optical disk with defective-sector substitution arrangement and optical information recording and reproducing system. 4,984,230, Cl. 369-54.000.

Satoh, Kazuhiro: *See*—
Watanabe, Youji; Kobayashi, Yoshiaki; and Satoh, Kazuhiro, 4,984,000, Cl. 354-195.100.

Satoh, Masaharu: *See*—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu; Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, 4,982,979, Cl. 280-707.000.

Satoh, Mitsumasa: *See*—
Sugino, Kimihiro; and Satoh, Mitsumasa, 4,983,975, Cl. 341-166.000.

Satoh, Shinichi: *See*—
Yoneda, Masahiro; Hatanaka, Masahiro; Kohno, Yoshio; Satoh, Shinichi; Oda, Hidekazu; and Moriizumi, Koichi, 4,984,199, Cl. 365-149.000.

Satoh, Takateru; Hashizume, Kenji; Sasaki, Morimasa; and Tanaka, Kimio, to TDK Corporation. Cleaning cassette for a video cassette tape deck. 4,984,120, Cl. 360-128.000.

Satoh, Yasuta; Nakane, Shigeru; and Yoneyama, Hitoshi, to Takara Co., Ltd. Rotating drive device. 4,983,890, Cl. 318-3.000.

Sauerwein, William D.; Miller, John W.; Vick, Stephen L.; and Bean, Rosemarie, to Black & Decker Inc. Depth of cut adjustment for a portable circular saw. 4,982,501, Cl. 30-376.000.

Saurer-Allma GmbH: *See*—
Stranzke, Gunter; Weber, Rolf D.; and Jenter, Erich, 4,982,561, Cl. 57-62.000.

Sauvage, Philippe: *See*—
Reiniche, Andre; and Sauvage, Philippe, 4,983,227, Cl. 148-128.000.

Sawa, Natsuo: *See*—
Nagaoka, Takeshi; Yoshioka, Takashi; Kamagata, Kazuo; Sawa, Natsuo; and Murai, Takayuki, 4,983,485, Cl. 430-110.000.

Sawa, Takao: *See*—
Murata, Shinichi; Yamauchi, Yoshiyuki; Kusaka, Takao; Sawa, Takao; and Yagi, Noriaki, 4,983,943, Cl. 336-213.000.

Sawada, Akihiro; and Yoshihara, Hideo, to Brother Kogyo Kabushiki Kaisha. Color image copying apparatus. 4,984,012, Cl. 355-27.000.

Sawada, Hirokazu; Kakei, Tsutomu; and Matsuki, Masaya, to Fuji Photo Film Co., Ltd. Method of splicing webs. 4,983,241, Cl. 156-157.000.

Sawada, Kazuhiro; Sakurai, Takayasu; and Nogami, Kazutaka, to Kabushiki Kaisha Toshiba. Dynamic read/write memory with improved refreshing operation. 4,984,208, Cl. 365-222.000.

Sawaki, Yukichi: *See—*
Sakakibara, Kenji; Akao, Michitoshi; Katoh, Tokunori; and Sawaki, Yukichi, 4,984,011, Cl. 355-27.000.

Saxon, Edward G. High confidence tube plug. 4,982,764, Cl. 138-89.000.

Sayles, David C., to United States of America, America. Corrosion prevention constituent for surface coatings. 4,983,321, Cl. 252-387.000.

Sayre, Daniel R.: *See—*
Rao, Madhukar; Tomko, Richard F.; and Sayre, Daniel R., 4,983,716, Cl. 528-272.000.

Scaramucci, John P. Swing check valve with secured cage. 4,982,759, Cl. 137-527.800.

Schaap, Arthur P., to Board of Governors of Wayne State University, The. Process for the preparation of vinyl ethers. 4,983,779, Cl. 568-660.000.

Schaefer, Philipp. Process for making dressed leatherlike composites. 4,983,245, Cl. 156-231.000.

Schaeffer, Hans A. Dental preparation, article and method for storage and delivery thereof. 4,983,379, Cl. 424-52.000.

Schafer, Horst: *See—*
Graeger, Volker; Kobs, Rolf U. D.; Schafer, Horst; and Zeile, Heinrich, 4,984,046, Cl. 357-26.000.

Schaffer, Ortwin: *See—*
Streicher, Rolf; Schaffer, Ortwin; Belde, Horst; and Guenthert, Paul, 4,983,185, Cl. 8-436.000.

Schaffner, Walter; and Westin, Nils G., to Boehringer Mannheim GmbH. Eukaryotic expression vectors with multimeric enhancer segments, a process for the preparation thereof and the use thereof. 4,983,518, Cl. 435-69.100.

Schafler, Winfried: *See—*
Kletzl, Franz; and Schafler, Winfried, 4,984,112, Cl. 360-96.600.

Schaub, Robert E.: *See—*
Wissner, Allan; Green, Kenneth; and Schaub, Robert E., 4,983,592, Cl. 514-92.000.

Schell, Maria G.: *See—*
Stacey, Gary; Schell, Maria G.; Nieuwkoop, Anthony J.; Deshmane, Nirupama A.; and Banfalvi, Zsofia, 4,983,519, Cl. 435-172.300.

Schepens, Herve : *See—*
De Bruyne, Roger; Schepens, Herve ; Lefever, Ignace; and Losfeld, Ronny, 4,983,467, Cl. 428-605.000.

Schering Aktiengesellschaft: *See—*
Buhmann, Ulrich; Hubl, Dieter; and Pieroh, Ernst-Albrecht, 4,983,755, Cl. 560-24.000.
Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; Sturzebecher, Claus-Steffen; and Elger, Walter, 4,983,629, Cl. 514-530.000.
Wegner, Peter; Joppien, Hartmut; Homberger, Gunter; and Kohn, Arnim, 4,983,630, Cl. 514-531.000.

Scheve, David M.; and Schnepfe, Robert W., Jr., to AAI Corporation. Safe-and-arm arrangement and projectile arrangement therewith. 4,982,663, Cl. 102-251.000.

Schildknecht, Manfred: *See—*
Bol, Johannes; and Schildknecht, Manfred, 4,982,648, Cl. 89-14.100.

Schirmann, Peter J.: *See—*
Ravichandran, Ramanathan; Schirmann, Peter J.; and Mar, Andrew, 4,983,737, Cl. 546-184.000.

Schirmer, Henry G., to W. R. Grace & Co.-Conn. Comfortable ostomy pouch. 4,983,171, Cl. 604-332.000.

Schlachter, Leo J., to ARO Corporation, The. Regulator with fluid supported and operated diaphragm. 4,982,758, Cl. 137-505.420.

Schlogl, Dietmar: *See—*
Neukrichner, Ernst-Peter; and Schlogl, Dietmar, 4,984,168, Cl. 364-449.000.

Schmid, Franz: *See—*
Nagel, Peter; and Schmid, Franz, 4,982,634, Cl. 82-129.000.

Schmid, Ralf: *See—*
Brunner, Matthias; Schmid, Ralf; and Regula, Michael, 4,983,833, Cl. 250-397.000.

Schmidt, Arno P. O., to Hilti Aktiengesellschaft. Sealing method and container assembly with improved seal. 4,982,878, Cl. 222-327.000.

Schmidt, Eric, to Wallace Computer Services, Inc. Mailer with I.D. card and method. 4,982,894, Cl. 229-69.000.

Schmidt, Richard A.: *See—*
Lue, Tom F.; Tanagho, Emil E.; Schmidt, Richard A.; and Gleason, Curtis A., 4,982,731, Cl. 128-79.000.

Schmidtmann, Burchard; and Cerda-Davo, Silvestre, to Deutsche Thomson-Brandt GmbH. Video recorder with increased bandwidth recording. 4,984,093, Cl. 358-330.000.

Schmied, Rudolf: *See—*
Angeloz, Corinne; Huerlimann, Peter; Schmied, Rudolf; and Van Meir, Eugene, 4,982,880, Cl. 222-490.000.

Schmitt, Gerhard: *See—*
Mielke, Horst; Schmitt, Gerhard; and Herbert, Peter, 4,983,188, Cl. 48-87.000.

Schmitt, Walter: *See—*
Nelle, Gunther; Schmitt, Walter; Schopf, Reinhold; and Weiss, Josef, 4,982,508, Cl. 33-702.000.

Schmode, Hartmut; Wiebe, Ulrich; and Undin, Hans, to C. A. Weidmuller GmbH & Co. Pliers-type tool. 4,982,630, Cl. 81-352.000.

Schmolke, Karl-Heinz, to Hollingsworth GmbH. Method of producing opening roller rings. 4,983,808, Cl. 219-121.640.

Schneider, Barry L., to Hollister Incorporated. Hermaphroditic coupling for anatomical thermal system. 4,982,736, Cl. 128-400.000.

Schneider, Fernand: *See—*
Barbier, Pierre; Schneider, Fernand; and Widmer, Ulrich, 4,983,746, Cl. 549-328.000.

Schnell, Klaus: *See—*
Bobar, Georg; Schnell, Klaus; Schroeder, Gerd; and Wistuba, Eckehardt, 4,983,760, Cl. 560-190.000.

Schnell, Wilhem-Gustav: *See—*
Muller, Manfred; Hess, Joachim; Schnell, Wilhem-Gustav; Bendix, Dieter; and Entenmann, Gunther, 4,983,745, Cl. 549-274.000.

Schnell, William J., to Invictus, Inc. Lancing device. 4,983,178, Cl. 606-181.000.

Schnepfe, Robert W., Jr.: *See—*
Scheve, David M.; and Schnepfe, Robert W., Jr., 4,982,663, Cl. 102-251.000.

Schoeffel, Gerd: *See—*
Stolle, Klaus; and Schoeffel, Gerd, 4,982,547, Cl. 52-656.000.

Scholtz, Edward C.: *See—*
Dempski, Robert E.; Scholtz, Edward C.; Nibbelink, Donald W.; and Reines, Scott A., 4,983,400, Cl. 424-469.000.

Schon, Uwe; Kehrbach, Wolfgang; and Wolf, Klaus-Ullrich, to Kali-Chemie Pharma GmbH. 3-sulfonyl-3,7-diazabicyclo[3,3,1]nonane intermediates and pharmaceutical method. 4,983,611, Cl. 514-300.000.

Schopf, Reinhold: *See—*
Nelle, Gunther; Schmitt, Walter; Schopf, Reinhold; and Weiss, Josef, 4,982,508, Cl. 33-702.000.

Schott Glaswerke: *See—*
Nattermann, Kurt, 4,983,014, Cl. 350-96.240.

Schotz, Larry. Tuned radio apparatus. 4,984,296, Cl. 455-193.000.

Schramm, Kathleen D.; and Karol, Frederick J., to Union Carbide Chemicals and Plastics Company Inc. High activity catalyst system for the production of propylene polymers. 4,983,562, Cl. 502-112.000.

Schreck, David J.: *See—*
Doumaux, Arthur R., Jr.; and Schreck, David J., 4,983,736, Cl. 544-402.000.

Schreiner, Sabine: *See—*
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, 4,982,598, Cl. 73-29.000.

Schroeder, Gerd: *See—*
Bobar, Georg; Schnell, Klaus; Schroeder, Gerd; and Wistuba, Eckehardt, 4,983,760, Cl. 560-190.000.

Schroit, Alan J.; and Nayar, Rajiv, to Board of Regents, University of Texas System. Pharmaceutical compositions consisting of acylated phospholipids. 4,983,397, Cl. 424-450.000.

Schucker, Robert C., to Exxon Research and Engineering Company. Isocyanurate crosslinked polyurethane membranes and their use for the separation of aromatics from non-aromatics. 4,983,338, Cl. 264-45.100.

Schuler, Claus; and Gerharz, Gabriele, to Asea Brown Boveri Ltd. Method of applying a catalyst layer consisting of precious metals and/or precious metal compounds to a substrate of ceramic material. 4,983,261, Cl. 204-30.000.

Schultz, David H., to Harbor Towne Fence, Inc. Fence connector clip and assembly. 4,982,933, Cl. 256-65.000.

Schultz, William J.: *See—*
Almer, Carl J.; and Schultz, William J., 4,983,672, Cl. 525-65.000.

Schultz, Wolf-Stefan; and Beyer, Uwe, to Klebstofwerke Collodin Dr. Schultz & Nauth GMBH. Invert size for the internal and surface sizing of paper. 4,983,257, Cl. 162-158.000.

Schumann, Gunter, to Hein, Lehmann AG. Slit-tube filter. 4,983,290, Cl. 210-413.000.

Schupp, Hans: *See—*
Lawrenz, Dirk; Schupp, Hans; Schwerzel, Thomas; Oslowski, Hans-Josef; and Heimann, Ulrich, 4,983,704, Cl. 528-69.000.

Schuppiser, Jean-Luc: *See—*
Chopin, Thierry; Quemere, Eric; Nortier, Patrice; Schuppiser, Jean-Luc; and Segaud, Christian, 4,983,563, Cl. 502-150.000.

Schuss, Werner: *See—*
Straihammer, Reinhard; Schuss, Werner; Goisser, Siegfried; and Beerstecher, Lutz, 4,983,121, Cl. 433-114.000.

Schuster, Otto: *See—*
Lukas, Helmut; Schuster, Otto; and Rau, Gunther, 4,983,765, Cl. 562-401.000.

Schuster, Rudolf; Raschke, Josef; and Kamperdicks, Klaus, to Siemens Aktiengesellschaft. Soldering means having at least one stirrup electrode and two soldering webs lying opposite one another or four soldering webs lying opposite one another in pairs. 4,982,890, Cl. 228-44.700.

Schwab, Frederick C., to Mobil Oil Corporation. Photoinitiators as light sensitive degradants for polyethylene. 4,983,645, Cl. 522-47.000.

Schwab, Peter A.: *See—*
Cox, Michael F.; Schwab, Peter A.; and Smith, Dewey L., 4,983,323, Cl. 252-551.000.

Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,982,507, Cl. 33-702.000.

Schwarz, Norbert: *See—*
Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; Sturzebecher, Claus-Steffen; and Elger, Walter, 4,983,629, Cl. 514-530.000.

Schweber, Miriam, to Boston University, The Trustees of. Quantitative analysis of biological materials and photogrtaphic film and apparatus therefor. 4,983,044, Cl. 356-443.000.

Schweikert, Willi: *See—*
Eckel, Hans-Gerd; and Schweikert, Willi, 4,982,937, Cl. 267-136.000.

Schwerzel, Thomas: *See—*
Lawrenz, Dirk; Schupp, Hans; Schwerzel, Thomas; Oslowski, Hans-Josef; and Heimann, Ulrich, 4,983,704, Cl. 528-69.000.

Science Research Center, Inc.: *See*—
Winans, Luther, Jr.; and Foster, Terry L., 4,983,163, Cl. 604-49.000.

Scifres, Donald R.; Welch, David F.; Endriz, John; and Streifer, William, to Spectra Diode Laboratories, Inc. GaAs/AlGaAs heterostructure laser containing indium. 4,984,242, Cl. 372-45.000.

Scott, Alan M., to Eolas. Container for use by travelling sales person. 4,982,820, Cl. 190-16.000.

Scott, Alistair, to Isoworth Limited. Carbonation apparatus. 4,982,876, Cl. 222-153.000.

Scott, Bentley N.; and Shortes, Samuel R., to Phase Dynamics, Inc. Marksmanship training apparatus. 4,983,123, Cl. 434-21.000.

Scott, David B.: *See*—
Tran, Hiep V.; and Scott, David B., 4,984,196, Cl. 365-51.000.

Scott, Terence A.: *See*—
Higgins, Larry; Scott, Terence A.; and Kawasaki, Nozomu, 4,982,466, Cl. 5-453.000.

Scribner, Michael E., to Conoco Inc. Use of ultrasonic energy to decrease the gel strength of waxy crude oil. 4,982,756, Cl. 137-4.000.

Seb S.A.: *See*—
Bourgeois, Christian, 4,982,654, Cl. 99-323.300.

Secor, Jacob: *See*—
Markley, Lowell D.; Hamilton, Christopher T.; Swisher, Beth A.; and Secor, Jacob, 4,983,211, Cl. 71-94.000.

Sedco Systems Inc.: *See*—
Volk, Paul R.; and Debski, Thomas R., 4,983,933, Cl. 333-109.000.

Sedgwick, Brian C.; and Mackenzie, Raymond K. Document shredder. 4,982,907, Cl. 241-236.000.

Sedlak, Rudolf P.: *See*—
Mombrun, Suzette L.; and Sedlak, Rudolf P., 4,983,224, Cl. 134-40.000.

Seebach, Dieter: *See*—
Imwinkelried, Rene; and Seebach, Dieter, 4,983,766, Cl. 562-470.000.

Seener, G. Thomas: *See*—
Heffner, Joseph H.; and Seener, G. Thomas, 4,982,578, Cl. 62-475.000.

Segaud, Christian: *See*—
Chopin, Thierry; Quemere, Eric; Nortier, Patrice; Schuppiser, Jean-Luc; and Segaud, Christian, 4,983,563, Cl. 502-150.000.

Seifert, Heinrich: *See*—
Roehrlein, Gerhard; and Seifert, Heinrich, 4,983,912, Cl. 324-202.000.

Seiffge, Dirk: *See*—
Weithmann, Klaus U.; and Seiffge, Dirk, 4,983,514, Cl. 435-29.000.

Seike, Shoji; Oguri, Noriyasu; Harada, Hiroshi; and Ishikawa, Junichi, to NGK Insulators, Ltd. High strength porcelains for use in insulators and production thereof. 4,983,556, Cl. 501-143.000.

Seiko Instruments Inc.: *See*—
Iwasaki, Koji, 4,983,830, Cl. 250-309.000.

Seita, Toru: *See*—
Tsutsumi, Yoshitaka; Seita, Toru; Matsumura, Kousaburou; Nagaoka, Kyoko; and Yanagihara, Toshimitsu, 4,983,495, Cl. 430-270.000.

Seitz, David R.; Finegold, Hyman B.; and Heaton, Mark T., to Globe Products Inc. Workpiece processing system. 4,982,827, Cl. 198-341.000.

Seitz Enzinger Noll Maschinenbau Aktiengesellschaft: *See*—
Ahlers, Egon, 4,982,768, Cl. 141-6.000.

Seitz-Filter-Werke Theo & Geo Seitz GmbH und Co.: *See*—
Karbachsch, Massoud; and Pett, Manfred, 4,983,288, Cl. 210-321.870.

Sekella, T. Curran, to Sepal. Torque and air gap adjustment mechanism for spring engaged brake or clutch. 4,982,825, Cl. 192-90.000.

Seki, Mitsuhiro, to Somar Corporation. Thin-film coating method and apparatus therefor. 4,983,248, Cl. 156-497.000.

Seki, Takahito: *See*—
Kanota, Keiji; Inoue, Hajime; and Seki, Takahito, 4,984,099, Cl. 360-46.000.

Sekiguchi, Akihiko, to Fuji Jukogyo Kabushiki Kaisha. Corner patch for rear quarter panel-rear skirt corner for an automotive vehicle. 4,982,994, Cl. 296-195.000.

Sekimoto, Takashi, to Konica Corporation. Motor driving apparatus with speed determined chopped drive and constant voltage drive control. 4,983,891, Cl. 318-66.000.

Sekine, Hiroshi; Yamaguchi, Mikio; Sadakata, Kiyoshi; and Fukunaga, Yuichiro, to Nippon Seiko Kabushiki Kaisha. Elastically coupled joint. 4,983,143, Cl. 464-89.000.

Self Manufacturing Company: *See*—
Kusta, Fred A., 4,982,864, Cl. 220-320.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,984,034, Cl. 357-17.000.

Senda, Hiroyuki: *See*—
Kurita, Hitoshi; Senda, Hiroyuki; and Terasaki, Hiroshi, 4,984,184, Cl. 364-551.010.

Seneker, Stephen D.; Potter, Terry A.; and Dunlap, Kenneth L., to Mobay Corporation. Process for preparing high trans, trans-isomer containing 4,4'-diisocyanato dicyclohexylmethane. 4,983,763, Cl. 560-352.000.

Sengoku, Koji; and Namba, Misako, to House Food Industrial Company Limited. Method of producing tofu-like food. 4,983,414, Cl. 426-634.000.

Senkan, Selim M., to Illinois Institute of Technology. Reduction in carbon oxides in oxidative pyrolysis of halogenated methanes. 4,983,783, Cl. 585-641.000.

Sensormatic Electronics Corporation: *See*—
Stiepel, Norbert M.; Thompson, Edwin; and Anderson, Luis, 4,984,089, Cl. 358-229.000.

Sentoku, Hajime: *See*—
Ueki, Toru; Sentoku, Hajime; Miyazaki, Takashi; and Sugihara, Eiichi, 4,983,435, Cl. 428-36.600.

Sepal: *See*—
Sekella, T. Curran, 4,982,825, Cl. 192-90.000.

Serres Naturtek Greenhouses Inc.: *See*—
Nesathurai, Samuel A., 4,983,307, Cl. 210-748.000.

Setoguchi, Shohachi: *See*—
Yokota, Chitoshi; Kawano, Minoru; Sueyoshi, Masahiko; Nishida, Toshiro; Setoguchi, Shohachi; and Fujimoto, Akira, 4,982,984, Cl. 292-201.000.

Severson, Larry: *See*—
Severson, Sandra S.; and Severson, Larry E., 4,982,885, Cl. 224-253.000.

Severson, Larry E.: *See*—
Severson, Sandra S.; and Severson, Larry E., 4,982,885, Cl. 224-253.000.

Severson, Sandie: *See*—
Severson, Sandra S.; and Severson, Larry E., 4,982,885, Cl. 224-253.000.

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Spiesser, Gilbert, 4,983,868, Cl. 310-49.00R.

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Casanova, Wayne J.; Reckinger, Arthur P., Jr.; Seyfert, Michael D.; Thorpe, James R.; and Wheeler, Stephen E., 4,984,133, Cl. 361-415.000.

SGS-Thomson Microelectronics, Inc.: *See*—
Steele, Randy C., 4,983,857, Cl. 307-272.300.

SGS-Thomson Microelectronics Srl: *See*—
Torazzina, Aldo, 4,983,927, Cl. 330-51.000.

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Blackmon, Kenneth P.; Clagett, Donald C.; and Shafer, Sheldon J., 4,983,718, Cl. 528-336.000.

Shah, Nyan S., to JNN International. Nail clipper with nail positioning device. 4,982,747, Cl. 132-75.500.

Shah, Piyush S.: *See*—
Kaczmarek, Stanislaus A.; Shah, Piyush S.; and Green, George A., 4,983,297, Cl. 210-605.000.

Shannon, Connie H.: *See*—
Gross, David C.; Johnson, Donald S.; and Shannon, Connie H., 4,983,641, Cl. 521-82.000.

Shannon, John M., to U.S. Philips Corporation. Liquid crystal display device. 4,983,022, Cl. 350-333.000.

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Andou, Yukinori; Yui, Yuhi; and Irihara, Kouichi, 4,984,018, Cl. 355-200.000.
Asanuma, Masato; Kaneshige, Masatoshi; and Aimoto, Toyoka, 4,982,691, Cl. 118-658.000.
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Funayama, Naotaka, 4,982,690, Cl. 118-657.000.
Katayama, Satoshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,983,741, Cl. 548-324.000.
Nakagawa, Kenichi; Kitazawa, Takeshi; and Kitamura, Takashi, 4,983,023, Cl. 350-344.000.
Tsuji, Shigeki; and Yokota, Taizo, 4,983,017, Cl. 350-162.170.
Yamamoto, Saburo; Morimoto, Taiji; Sasaki, Kazuaki; Kondo, Masaki; Suyama, Takahiro; and Kondo, Masafumi, 4,984,244, Cl. 372-461.000.

Shaw, John G.: *See*—
Hack, Michael; and Shaw, John G., 4,984,041, Cl. 357-23.700.

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Shea, John J.; Sabol, Richard P.; Paich, Louis; Cheski, Ronald A.; Sanner, Kenneth W.; and Beatty, William E., Jr., to Westinghouse Electric Corp. Circuit breaker with adjustable low magnetic trip. 4,983,939, Cl. 335-42.000.

Sheleg, Valery K.: *See*—
Stepanenko, Alexandr V.; Vereschagin, Mikhail N.; Paly, Oleg I.; Sheleg, Valery K.; Kaptsevich, Vyacheslav M.; Gorunov, Valery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V., 4,982,780, Cl. 164-463.000.

Shell Oil Company: *See*—
Jackson, Roy J., 4,983,709, Cl. 528-230.000.
Smutny, Edgar J., 4,983,649, Cl. 524-13.000.
Van Loon, Petrus J. M., 4,982,870, Cl. 220-414.000.
Willis, Carl L.; and Pottick, Lorelle A., 4,983,673, Cl. 525-92.000.

Sheng, Chyi N.: *See*—
Manns, William G.; Norwood, David A.; Weeks, Don J.; Sheng, Chyi N.; and Wood, Anthony B., 4,984,282, Cl. 382-8.000.

Sher, Cheng-Hsien. Expansible garbage can for classification of garbages. 4,982,857, Cl. 220-8.000.

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Gupta, Goutam; and Mels, Sherman J., 4,983,266, Cl. 204-181.700.

Johansen, Norman A., 4,982,852, Cl. 211-162.000.
Petrie, Brian C.; Druetzler, Thomas W.; and Harris, Rodney M., 4,983,676, Cl. 525-107.000.
Rao, Madhukar; Tomko, Richard F.; and Sayre, Daniel R., 4,983,716, Cl. 528-272.000.

Shibano, Yoshizo; Suzuki, Haruo; and Iwai, Tohru, to Sumitomo Electric Industries, Ltd. Roadside beacon system with polarized beams. 4,983,984, Cl. 343-711.000.

Shibata, Masanori: *See—*
Hashimoto, Takayoshi; Shibata, Masanori; Okimoto, Haruo; Tashima, Seiji; Yamada, Kaoru; Akagi, Toshimichi; Shimizu, Ritsuharu; Yamamoto, Masaru; and Ohmori, Masashi, 4,982,567, Cl. 60-600.000.

Shibata, Norio: *See—*
Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, 4,982,687, Cl. 118-410.000.

Shibata, Tadashi: *See—*
Ohmi, Tadahiro; Shibata, Tadashi; and Umeda, Masaru, 4,984,060, Cl. 357-68.000.

Shibata, Takanori: *See—*
Igarashi, Osamu; Shibata, Takanori; Matuoka, Yoji; Watanabe, Kazuhiro; and Terashima, Kunio, 4,983,951, Cl. 340-461.000.

Shibukawa, Takeo, to Yamaha Corporation. Electronic musical instrument with tone-sustaining controller. 4,982,644, Cl. 84-627.000.

Shibuya, Toshiteru: *See—*
Hanatani, Syuichi; Akagi, Masanobu; Nigo, Kouemon; Sugaya, Ritsuo; and Shibuya, Toshiteru, 4,984,154, Cl. 364-200.000.

Shida, Masami: *See—*
Amano, Matsuo; and Shida, Masami, 4,984,167, Cl. 364-431.040.

Shida, Takafumi; Kubota, Yoshikazu; Ichinose, Isao; Watanabe, Takeo; Yamazaki, Shiro; and Shinkawa, Hiroyasu, to Kureha Kagaku Kogyo Kabushiki Kaisha. 4,5-dihydro-1H-1,2,4-triazole-3-carboxamide derivatives and herbicidal composition containing the same. 4,983,209, Cl. 71-92.000.

Shields, Jack C. Self-elevating limb support. 4,982,745, Cl. 128-877.000.

Shields, Robert L. Sod cutter. 4,982,800, Cl. 172-19.000.

Shields, William D. Alignment apparatus for use in freeweight barbell systems. 4,982,957, Cl. 272-123.000.

Shigematu, Hironobu: *See—*
Aoshima, Masashi; Shigematu, Hironobu; and Sato, Mitsuhiko, 4,983,685, Cl. 525-331.800.

Shigemoto, Hiromi; Takeda, Masami; and Muro, Tsuneaki, to Mitsui Petrochemical Industries, Ltd. Hot melt adhesive compositions. 4,983,674, Cl. 525-97.000.

Shih, Stuart S.: *See—*
Kennedy, Clinton R.; Shih, Stuart S.; and Ware, Robert A., 4,983,273, Cl. 208-89.000.

Shikama, Shinsuke; and Toide, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Optical head device. 4,983,002, Cl. 350-3.600.

Shikoku Chemicals Corporation: *See—*
Nagaoka, Takeshi; Yoshioka, Takashi; Kamagata, Kazuo; Sawa, Natsuo; and Murai, Takayuki, 4,983,485, Cl. 430-110.000.

Shikoku Kokoki Co., Ltd.: *See—*
Saijo, Yoshihiro; Arao, Takashi; and Yamane, Yoshitaka, 4,982,770, Cl. 141-258.000.

Shimada, Hideo, to Fuji Jukogyo Kabushiki Kaisha. Camber setting apparatus of a strut type suspension. 4,982,977, Cl. 280-661.000.

Shimada, Satoru: *See—*
Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, 4,982,804, Cl. 180-140.000.

Shimadzu Corporation: *See—*
Kita, Yasuo, 4,983,149, Cl. 475-76.000.

Shimanishi, Asao: *See—*
Inagaki, Jitsuo; Shimanishi, Asao; and Ono, Taisaburo, 4,983,286, Cl. 210-257.100.

Shimanuki, Haruki: *See—*
Yoshizawa, Hiroyuki; Eguchi, Satoru; Shimanuki, Haruki; Miyake, Katsuya; and Hirobe, Yoshiaki, 4,982,806, Cl. 180-197.000.

Shimizu, Etsuyo: *See—*
Nakanishi, Satoshi; Yamada, Koji; Ando, Katsuhiko; Kawamoto, Isao; Yasuzawa, Toru; Sano, Hiroshi; Hirayama, Noriaki; Kase, Hiroshi; Goto, Joji; and Shimizu, Etsuyo, 4,983,775, Cl. 568-446.000.

Shimizu, Hideaki: *See—*
Nakajima, Shin; Yamataka, Akira; Shimizu, Hideaki; Yamauchi, Kiyotaka; and Arakawa, Shunsuke, 4,983,859, Cl. 307-419.000.

Shimizu, Joji; Chujo, Yuji; Yamamoto, Yasushi; and Noda, You, to Nissan Motor Company, Limited. Heating system for automotive vehicles. 4,982,895, Cl. 237-2.00A.

Shimizu, Jyousei: *See—*
Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, 4,984,115, Cl. 360-106.000.

Shimizu, Osamu; and Yoshida, Satoshi, to Fuji Photo Film Co., Ltd. Thin film magnetic head. 4,983,465, Cl. 428-472.000.

Shimizu, Ritsuharu: *See—*
Hashimoto, Takayoshi; Shibata, Masanori; Okimoto, Haruo; Tashima, Seiji; Yamada, Kaoru; Akagi, Toshimichi; Shimizu, Ritsuharu; Yamamoto, Masaru; and Ohmori, Masashi, 4,982,567, Cl. 60-600.000.

Shimizu, Takaaki: *See—*
Kuwata, Satoshi; Goi, Takahiro; Shimizu, Takaaki; and Ogihara, Tsutomu, 4,983,388, Cl. 424-401.000.

Shimoda, Kouzou: *See—*
Shukunobe, Yukitaka; Nakamura, Tetsuo; Aono, Koji; Doki, Ryoichi; Kuwazuru, Mamoru; Shimoda, Kouzou; and Yoshida, Tomoe, 4,983,361, Cl. 422-145.000.

Shimomoto, Hironori: *See—*
Kobayashi, Kazuo; Miyahara, Hitoshi; Nishikizawa, Hidemaru; Shimomoto, Hironori; and Maruyama, Osamu, 4,983,802, Cl. 219-69.120.

Shimp, David A., to Hi-Tek Polymers, Inc. Polycyanate esters of polyhydric phenols blended with thermoplastic polymers. 4,983,683, Cl. 525-390.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Kuwata, Satoshi; Goi, Takahiro; Shimizu, Takaaki; and Ogihara, Tsutomu, 4,983,388, Cl. 424-401.000.
Nakano, Akio; and Takei, Hirosi, 4,983,642, Cl. 521-88.000.

Shin-Etsu Chemical Co., Ltd: *See—*
Hara, Yasuaki; Ogawa, Masahiko; and Kashida, Meguru, 4,983,701, Cl. 528-15.000.

Shinagawa, Keisuke: *See—*
Fujimura, Shuzo; Shinagawa, Keisuke; and Hikazutani, Kenichi, 4,983,254, Cl. 156-643.000.

Shinkawa, Hiroyasu: *See—*
Shida, Takafumi; Kubota, Yoshikazu; Ichinose, Isao; Watanabe, Takeo; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,983,209, Cl. 71-92.000.

Shinkubo, Kenzo: *See—*
Saitoh, Masao; Endo, Katsuhiko; Endoh, Yuzo; Kuroda, Takeshi; Saito, Makoto; and Shinkubo, Kenzo, 4,982,534, Cl. 52-63.000.

Shipley Company Inc.: *See—*
Trefonas, Peter, III; Zampini, Anthony; and Madoux, David C., 4,983,492, Cl. 430-191.000.

Shirafuji, Yoshinori: *See—*
Kawaguchi, Susumu; Shirafuji, Yoshinori; Maeyama, Hideaki; Sugita, Tatsuya; and Yamamoto, Takashi, 4,983,108, Cl. 418-63.000.

Shirai, Kiyohide: *See—*
Yonemasu, Hiro; Shirai, Kiyohide; and Kawamura, Ikunosuke, 4,982,494, Cl. 29-827.000.

Shirai, Takao: *See—*
Sugiyama, Masanori; Shirai, Takao; Masutani, Takayoshi; and Yoshikawa, Isao, 4,983,896, Cl. 318-286.000.

Shiraishi, Ikuya: *See—*
Matusita, Yoshio; Mochizuki, Takeshi; and Shiraishi, Ikuya, 4,982,897, Cl. 239-71.000.

Shirasaki, Yoshikazu, to Toyo Boseki Kabushiki Kaisha. Fiber reinforced plastic and its reinforcement. 4,983,433, Cl. 422-36.100.

Shirotori, Hidefumi: *See—*
Otani, Atsushi; Shirotori, Hidefumi; Morikawa, Nobuyuki; and Otani, Shunsuke, 4,982,970, Cl. 279-123.000.

Shookhtim, Rimon; Lee, Lo-Shan; and Mansoorian, Babak, to Unisys Corporation. High speed static BiCMOS memory with dual read ports. 4,984,203, Cl. 365-177.000.

Shortes, Samuel R.: *See—*
Scott, Bentley N.; and Shortes, Samuel R., 4,983,123, Cl. 434-21.000.

Shouji, Hideaki: *See—*
Okamoto, Masamitsu; Wada, Masami; Funikawa, Hidenori; Kato, Haruo; and Shouji, Hideaki, 4,982,495, Cl. 29-846.000.

Showa Aluminum Corporation: *See—*
Suzuki, Katsuhisa; and Matsubayashi, Hiroshi, 4,982,579, Cl. 62-515.000.

Shroot, Braham; and Allec, Josiane, to Centre International de Recherches Dermatologiques (CIRD). Psoralene-based bath compositions for treatment of skin disorders. 4,983,625, Cl. 514-455.000.

Shu, Joseph S., to Nynex Corporation. Halftone reproduction with enhanced gray level reproducibility. 4,984,097, Cl. 358-429.000.

Shukunobe, Yukitaka; Nakamura, Tetsuo; Aono, Koji; Doki, Ryoichi; Kuwazuru, Mamoru; Shimoda, Kouzou; and Yoshida, Tomoe, to R&D Association for Bioreactor System. Reactor provided with fluidized chamber. 4,983,361, Cl. 422-145.000.

Shukuri, Shoji: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.

Sibuet, Rene : *See—*
Wright, Dan; Riach, Allan; Crinquette, Jean-Marie; Sibuet, Rene ; and Long, Jacques, 4,983,106, Cl. 418-2.000.

Sichel, Enid K.: *See—*
Ditchek, Brian M.; Cogan, Adrian I.; Sichel, Enid K.; and Bloss, Walter L., III, 4,984,037, Cl. 357-22.000.

Siebert, Jean-Marie: *See—*
Badie, Paul; and Siebert, Jean-Marie, 4,983,682, Cl. 525-290.000.

Siecor Corporation: *See—*
Blew, Douglas J., 4,983,333, Cl. 264-1.500.

Siemens Aktiengesellschaft: *See—*
Brunner, Matthias; Schmid, Ralf; and Regula, Michael, 4,983,833, Cl. 250-397.000.
Busse, Ingeborg; and Mair, Eduard, 4,983,126, Cl. 439-61.000.
Dangschat, Rainer; and Paulik, Ernst, 4,984,145, Cl. 363-19.000.
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, 4,982,598, Cl. 73-29.000.
Dotzer, Peter; Glaser, Heinz; Mayr, Ernst; and Oestreich, Ulrich, 4,983,013, Cl. 350-96.230.
Henkel, Hans-Joachim; Markert, Helmut; Roth, Wolfgang; and Kautek, Wolfgang, 4,983,419, Cl. 427-53.100.

Roehrlein, Gerhard; and Seifert, Heinrich, 4,983,912, Cl. 324-202.000.
Schuster, Rudolf; Raschke, Josef; and Kamperdicks, Klaus, 4,982,890, Cl. 228-44.700.
Straihammer, Reinhard; Schuss, Werner; Goisser, Siegfried; and Beerstecher, Lutz, 4,983,121, Cl. 433-114.000.

Sigma Instruments, Inc.: *See—*
Yeh, Thomas, 4,984,124, Cl. 361-59.000.

Sikkens, Paul J.: *See—*
de Groot, Johannes J.; and Sikkens, Paul J., 4,982,861, Cl. 220-89.100.

Sikora, Leonard A., to Goodyear Tire & Rubber Company, The. DNA fragment encoding a rubber polymerase and its use. 4,983,729, Cl. 536-28.000.

Siliconix Incorporated: *See—*
Blanchard, Richard A., 4,983,535, Cl. 437-40.000.

Silye, Sandor: *See—*
Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, 4,983,764, Cl. 562-17.000.

Simizu, Teruo: *See—*
Nakamura, Satoshi; Simizu, Teruo; Naruse, Reizo; and Igawa, Hiroyuki, 4,983,876, Cl. 310-328.000.

Simmonds Precision Products, Inc.: *See—*
Spillman, William B., Jr., 4,983,034, Cl. 356-32.000.

Simon, Joseph A. Method of extruding channeled sleeves. 4,982,592, Cl. 72-260.000.

SINCO, Incorporated: *See—*
Starr, John F., 4,982,813, Cl. 182-138.000.

Singer, Alfred R. E.: *See—*
Sansome, Dennis H.; and Singer, Alfred R. E., 4,983,427, Cl. 427-347.000.

Sipinen, Alan J.: *See—*
Noreen, Allen L.; Crissinger, Dean R.; Melbye, William L.; Rodgers, Eric G.; Sipinen, Alan J.; and Wood, Leigh F., 4,983,174, Cl. 604-389.000.

Sirena S.p.A.: *See—*
Garnerone, Alberto, 4,984,142, Cl. 362-249.000.

Sitzes, Paul E.: *See—*
Farris, Charles J.; Whitlow, Joseph E.; and Sitzes, Paul E., 4,982,473, Cl. 15-256.600.

Sivan, Richard D.: *See—*
Pfiester, James R.; Baker, Frank K.; and Sivan, Richard D., 4,984,042, Cl. 357-23.900.

Sjostrom, Douglas D., to Smith & Nephew Dyonics Inc. Arthroscopic surgical instrument. 4,983,179, Cl. 606-180.000.

Skelton, Richard T.: *See—*
Stewart, Peter A. E.; Skelton, Richard T.; Allen, Martin J.; and Douglas, Joseph, 4,983,841, Cl. 250-358.100.

SKF GmbH: *See—*
Kunkel, Heinrich; and Olschewski, Armin, 4,983,101, Cl. 417-362.000.

SKF Textilmaschinen-Komponenten GmbH: *See—*
Mette, Klaus; and Speiser, Helmut, 4,982,562, Cl. 57-132.000.

Skillius, Hans, to A/S E. Danberg Group. Portable box. 4,982,863, Cl. 220-318.000.

Skinner, Kenneth R.; and Bingham, Joseph P., to North American Philips Corporation. Single channel NTSC compatible EDTV system. 4,984,078, Cl. 358-141.000.

Slane, Steven M.; and Plichta, Edward J., to United States of America, Army. Rechargeable lithium battery system. 4,983,476, Cl. 429-197.000.

Slawinski, Christopher: *See—*
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., 4,983,226, Cl. 148-33.200.

Slayton, Danny L.: *See—*
Charles, Kirk W.; and Slayton, Danny L., 4,983,146, Cl. 474-117.000.

Sliger, Boyd P., to Robertshaw Controls Company. Vehicle cooling system subassembly and parts therefor. 4,982,704, Cl. 123-41.100.

Slusher, Richart E.; and Yurke, Bernard, to AT&T Bell Laboratories. Wideband low noise detector. 4,984,298, Cl. 455-619.000.

SMH Alcatel: *See—*
Vermesse, Bernard, 4,984,191, Cl. 364-900.000.

Smiley, Charles L.: *See—*
Geier, Raymond R.; Smiley, Charles L.; and Stanger, Robert L., 4,984,155, Cl. 364-401.000.

Smisson, Robert P. M.: *See—*
Lamb, Timothy J.; and Smisson, Robert P. M., 4,983,295, Cl. 210-521.000.

Smith, Dewey L.: *See—*
Cox, Michael F.; Schwab, Peter A.; and Smith, Dewey L., 4,983,323, Cl. 252-551.000.

Smith, Gregg L.: *See—*
Gressett, Charles A., Jr.; and Smith, Gregg L., 4,982,986, Cl. 292-336.300.

Smith, James C.; Allen, R. Wade; and Jex, Henry R., to Systems Technology, Inc. Device for measuring human performance. 4,983,125, Cl. 434-258.000.

Smith, James C.: *See—*
Saidman, Laurence B.; and Smith, James C., 4,983,424, Cl. 427-243.000.

Smith, James L. Auxiliary power source with charger and integral light source. 4,983,473, Cl. 429-48.000.

Smith-Johannsen, Robert: *See—*
Berg, Johannes G.; and Smith-Johannsen, Robert, 4,983,342, Cl. 264-113.000.

Smith, Julius O., to Leland Stanford Junior University, The Board of Trustees of the. Digital signal processing using waveguide networks. 4,984,276, Cl. 381-63.000.

Smith, Marion W.: *See—*
Gordon, Russell B.; Gordon, Jimmy A.; and Smith, Marion W., 4,982,653, Cl. 98-39.100.

Smith, Michael W.; and Heilman, Michael B., to General Electric Company. Radio communications device incorporating channel guard decode and priority channel scanning. 4,984,294, Cl. 455-166.000.

Smith & Nephew Dyonics Inc.: *See—*
Sjostrom, Douglas D., 4,983,179, Cl. 606-180.000.

Smith, Peter J., to Pomico International, Inc. Module and method for constructing sealing load-bearing retaining wall. 4,982,544, Cl. 52-606.000.

Smith, Richard: *See—*
Erb, Roger; Johnson, Robert; and Smith, Richard, 4,983,203, Cl. 65-265.000.

Smith, Robert, to Motorola, Inc. Subscriber line card arrangement. 4,984,266, Cl. 379-399.000.

Smith, Ronald R.: *See—*
Laughner, Michael K.; Shaw, Kenneth R.; and Smith, Ronald R., 4,983,648, Cl. 523-351.000.

Smutny, Edgar J., to Shell Oil Company. Stabilized polyketone blend. 4,983,649, Cl. 524-13.000.

Snamprogetti S.p.A.: *See—*
Lagana, Vincenzo; Ercolani, Dario ; and Donati, Elio, 4,983,187, Cl. 44-280.000.

Snap-on Tools Corporation: *See—*
Rittmann, Nancy C., 4,982,612, Cl. 73-862.230.

SNE Enterprises, Inc.: *See—*
Palmer, Douglas J., 4,982,530, Cl. 49-504.000.

Snugli, Inc.: *See—*
Knoedler, Roy E.; Parker, Robert M.; Au, William G.; and Gebhard, Albert W., 4,982,997, Cl. 297-296.000.

Societe Anonyme dite: Alcatel Cit: *See—*
Wright, Dan; Riach, Allan; Crinquette, Jean-Marie; Sibuet, Rene ; and Long, Jacques, 4,983,106, Cl. 418-2.000.

Societe Anonyme dite : Laserdot: *See—*
Cabaret, Louis; Girard, Genevieve; Pinson, Pierre; and De Saxce, Thibaut, 4,984,246, Cl. 372-69.000.

Societe Anonyme Dite: Telic Alcatel: *See—*
Vergnaud, Gerard; and Thomas, Gerard, 4,984,234, Cl. 370-58.100.

Societe Anonyme: SANOFI: *See—*
Wermuth, Camille G.; Worms, Paul; Bourguignon, Jean-Jacques; and Brodin, Roger, 4,983,603, Cl. 514-232.800.

Societe Atochem: *See—*
Benefice-Malouet, Sylvie; Blancou, Hubert; and Commeyras, Auguste, 4,983,776, Cl. 568-490.000.

Societe Generale pour l'Industrie Electronique (S.O.C.I.E.): *See—*
Baldyrou, Armel, 4,983,134, Cl. 439-884.000.

Societe Nationale Elf Aquitaine: *See—*
Cahiez, Gerard; Laboue, Blandine; and Tozzolino, Pierre, 4,983,774, Cl. 568-319.000.
Juge, Sylvain, 4,983,768, Cl. 564-12.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Houot, Jean-Jacques, 4,982,794, Cl. 166-357.000.

Soderberg, Bo; Pettersson, Bo; Hocke, Ulf; and Naeve, Ambjorn, to C.E. Johansson AB. Method for determining positional errors and for compensating for such errors, and apparatus for carrying out the method. 4,982,504, Cl. 33-502.000.

Soejima, Tetsuo: *See—*
Watanabe, Toshiaki; Iguchi, Kazuo; and Soejima, Tetsuo, 4,984,238, Cl. 370-105.100.

Soga, Mamoru; Hotta, Shu; and Sonoda, Nobuo, to Matsushita Electric Industrial Co., Ltd. Process for producing polyacetylene. 4,983,696, Cl. 526-159.000.

Sogabe, Eiji: *See—*
Sasaki, Toshio; Sogabe, Eiji; and Ebara, Takeshi, 4,983,561, Cl. 502-107.000.

Sollars, Herbert M. Animal operated feeder. 4,982,698, Cl. 119-54.000.

Solomon, Dennis J. Three-dimensional volumetric display system. 4,983,031, Cl. 353-10.000.

Somar Corporation: *See—*
Seki, Mitsuhiro, 4,983,248, Cl. 156-497.000.

Somers, Robert I.; Harman, William G., Jr.; O'Hara, Frank; and Stumpf, William R., to Black & Decker, Inc. Push-button controlled apparatus for releasably storing a tool bit. 4,983,080, Cl. 408-241.00R.

Sommer, Herbert; Arlt, Dieter; Hartwig, Jurgen; Homeyer, Bernhard; and Matthaei, Hans-Detlef, to Bayer Aktiengesellschaft. Pesticidal thionophosphoric acid amine esters. 4,983,594, Cl. 514-137.000.

Sondages Injections Forages Entreprise Bachy: *See—*
Delmas, Francis M.; and Gandais, Michel A., 4,983,075, Cl. 405-267.000.

Song, Kun K.: *See—*
Petty, Terry D.; Chabot, Luc G.; Costello, Carmon R.; and Song, Kun K., 4,983,073, Cl. 405-224.000.

Sonoda, Nobuo: *See—*
Soga, Mamoru; Hotta, Shu; and Sonoda, Nobuo, 4,983,696, Cl. 526-159.000.

Sonoda, Takuji: *See—*
Sakamoto, Shinichi; and Sonoda, Takuji, 4,984,036, Cl. 357-22.000.

Sony Corporation: *See—*
Kanota, Keiji; Inoue, Hajime; and Seki, Takahito, 4,984,099, Cl. 360-46.000.
Kanota, Keiji; and Murabayashi, Noboru, 4,984,101, Cl. 360-65.000.
Kayanuma, Akio, 4,984,053, Cl. 357-50.000.
Kokubo, Yuji, 4,984,002, Cl. 358-213.130.
Murakami, Yoshikazu; Ogihara, Takahiro; Okamoto, Tsutomu; and Niikura, Kanako, 4,983,936, Cl. 333-202.000.
Sato, Shinya, 4,984,122, Cl. 360-132.000.
Takahashi, Takao; and Nakano, Kenji, 4,984,104, Cl. 360-77.140.
Yamamura, Michio, 4,984,044, Cl. 357-24.000.

Soptei, Csaba: *See—*
Pelyva, Jeno; Lendvai, Laszlo; Balint, Sandor; Kolonics, Zoltan; Soptei, Csaba; Laszlo, Sandor; Karacsonyi, Bela; Benczik, Janosne; Kayos, Csaba; and Silye, Sandor, 4,983,764, Cl. 562-17.000.

Sorge, Werner; and Konieczny, Klaus, to Gebhardt & Koenig-Gesteins-und Tiefbau GmbH. Method and an apparatus for producing fabric-reinforced lining supports or slender supporting structural units. 4,983,077, Cl. 405-288.000.

Southern Tea Company: *See—*
Dinos, Jack A., 4,983,410, Cl. 426-77.000.

Spadafora, Vincent J.: *See—*
Tsang, Tsze H.; Spadafora, Vincent J.; and Pomidor, Patricia, 4,983,589, Cl. 514-64.000.

Sparks, Sam L.: *See—*
Peterson, Stephen C.; Brimhall, Owen D.; McLaughlin, Thomas J.; Baker, Charles D.; and Sparks, Sam L., 4,983,189, Cl. 55-15.000.

Spath, Werner F., to Exibelco GmbH. Connecting element. 4,983,065, Cl. 403-252.000.

Speakman, John-Bryan; Karl, Rudolf; Lorenz, Gisela; Ammermann, Eberhard; Wuerzer, Bruno; Meyer, Norbert; and Ditrich, Klaus, to BASF Aktiengesellschaft. Dihydrodibenzofuran derivatives and fungicides containing these compounds. 4,983,587, Cl. 514-63.000.

Specialty Appliance Works, Inc.: *See—*
Coleman, Angus C.; and Newhart, Scott G., 4,983,120, Cl. 433-24.000.

Specialty Manufacturing Co., Inc.: *See—*
Wicker, James H., 4,983,949, Cl. 340-433.000.

Speck, Frank: *See—*
Kimberlin, Robert R.; Geiger, Robert E.; Speck, Frank; and Allis, Wayne, 4,983,152, Cl. 475-331.000.

Spector, George: *See—*
Vu, Thuan D.; and Spector, George, 4,982,992, Cl. 296-97.600.

Spectra Diode Laboratories, Inc.: *See—*
Scifres, Donald R.; Welch, David F.; Endriz, John; and Streifer, William, 4,984,242, Cl. 372-45.000.

Spectrum Sciences B.V.: *See—*
Landa, Benzion; Lavon, Amiran; Pinhas, Hanna; and Adam, Yossi, 4,984,025, Cl. 355-274.000.

Speiser, Helmut: *See—*
Mette, Klaus; and Speiser, Helmut, 4,982,562, Cl. 57-132.000.

Spencer, John D.: *See—*
Davall, Peter W. N.; and Spencer, John D., 4,983,853, Cl. 250-554.000.

Spielmannleitner, Rudolf: *See—*
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedel, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 4,983,366, Cl. 423-240.000.

Spiesser, Gilbert, to Sextant Avionique. Disengageable linear stepper motor. 4,983,868, Cl. 310-49.00R.

Spillman, William B., Jr., to Simmonds Precision Products, Inc. Composite integrity monitoring. 4,983,034, Cl. 356-32.000.

Sporlan Valve Company: *See—*
Heffner, Joseph H.; and Seener, G. Thomas, 4,982,578, Cl. 62-475.000.

Springer, Cort: *See—*
Noguchi, Hiroyuki; and Springer, Cort, 4,982,492, Cl. 29-446.000.

Springer, Gilbert D., to Springer Technologies. Flux-concentrating, non-ghosting electromagnetic read/write head. 4,984,118, Cl. 360-125.000.

Springer Technologies: *See—*
Springer, Gilbert D., 4,984,118, Cl. 360-125.000.

Sprung, Philip D. Seedling propagation assembly. 4,982,527, Cl. 47-59.000.

Sprunt, Eve S.: *See—*
Davis, R. Michael; Sprunt, Eve S.; and Quigley, M. Scott, 4,982,604, Cl. 73-153.000.

Spry, Douglas O.: *See—*
Blaszczak, Larry C.; Munroe, John E.; and Spry, Douglas O., 4,983,732, Cl. 540-360.000.

Spurbeck, Kenneth C.: *See—*
Stroze, Mark S.; and Spurbeck, Kenneth C., 4,983,141, Cl. 464-7.000.

Spurling, Daniel P. Safety valve coupling. 4,982,929, Cl. 251-149.900.

Square D Company: *See—*
Geier, Raymond R.; Smiley, Charles L.; and Stanger, Robert L., 4,984,155, Cl. 364-401.000.

Staar S. A.: *See—*
Agostini, Louis P. C., 4,984,228, Cl. 369-37.000.

Stacey, Gary; Schell, Maria G.; Nieuwkoop, Anthony J.; Deshmane, Nirupama A.; and Banfalvi, Zsofia. Recombinant DNA clones of essential nodulation genes of *bradyrhizobium japonicum* . 4,983,519, Cl. 435-172.300.

Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Sliver connecting arrangement for a spinning machine. 4,982,563, Cl. 57-261.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,982,563, Cl. 57-261.000.

Stahlhofen, Paul; and Mohr, Dieter, to Hoechst Aktiengesellschaft. Burn-in gumming composition for offset printing plates. 4,983,478, Cl. 430-14.000.

Stahli, Urs; Fritzsche, Peter; Bosshard, Marcel; and Demuth, Robert, to Maschinenfabrik Rieter AG. Carding machine with modular subdivision of the carding zones. 4,982,478, Cl. 19-102.000.

Stanec, George. Hand and arm board for use in intravenous administration and other monitoring tests. 4,982,744, Cl. 128-877.000.

Stanford University: *See—*
Majidi-Ahy, Gholamreza; and Bloom, David M., 4,983,910, Cl. 324-158.00P.

Stanger, Robert L.: *See—*
Geier, Raymond R.; Smiley, Charles L.; and Stanger, Robert L., 4,984,155, Cl. 364-401.000.

Stanley Aviation Corporation: *See—*
Dinsmoor, John C.; and Van Everen, Barry, 4,982,860, Cl. 220-606.000.

Stanley Works, The: *See—*
Bickford, Dudley V., 4,982,910, Cl. 242-107.000.

Starch, Michael S., to Dow Corning Corporation. Dispersible silicone antifoam formulations. 4,983,316, Cl. 252-174.150.

Starr, John F., to SINCO, Incorporated. Shock absorbing safety net. 4,982,813, Cl. 182-138.000.

Starre, Stephen T.: *See—*
Maiette, Ralph L.; Starre, Stephen T.; Thomas, Dayton C.; and Crandall, Craig E., 4,983,809, Cl. 392-407.000.

State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University, The: *See—*
Ayres, James W.; Sandine, William E.; and Parker, Richard B., 4,983,406, Cl. 426-9.000.

Stavropoulos, Napoleon, to Lummus Crest, Inc. Process for delayed coking of coking feedstocks. 4,983,272, Cl. 208-50.000.

Steel, Davina: *See—*
Turner, Anthony P. F.; Hodges, Alan P.; Franklin, Ann; Ramsay, Graham; and Steel, Davina, 4,983,516, Cl. 435-34.000.

Steele, Guy L., Jr.: *See—*
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 4,984,235, Cl. 370-60.000.

Steele, Randy C., to SGS-Thomson Microelectronics, Inc. Power-up reset circuit. 4,983,857, Cl. 307-272.300.

Steen, James W.: *See—*
Eichhorn, Hans-Dieter; Dancey, Martin J.; Herrmann, Guenter; and Steen, James W., 4,983,752, Cl. 558-322.000.

Steer, Peter L.; and Edwards, John V., to Kingsdown Medical Consultants. Clip for drainable ostomy pouch. 4,983,172, Cl. 604-332.000.

Steffens, Ralf; Kabelitz, Hans-Peter; Berges, Hanns-Peter; and Leier, Wolfgang, to Leybold Aktiengesellschaft. Multistage rotary piston vacuum pump having sleeves to fix shaft positions. 4,983,107, Cl. 418-9.000.

Stegmuller, Karl, to Sachsenwerk Aktiengesellschaft. Switch chamber for a vacuum switch. 4,983,793, Cl. 200-144.00B.

Steinbach, Gerhard, to Henkel Kommanditgesellschaft auf Aktien. Appliance for the treatment of textile floor coverings. 4,983,060, Cl. 401-140.000.

Steinemann, Samuel G., to Institut Straumann AG. Alloplastic material for producing an artificial soft tissue component and/or for reinforcing a natural soft tissue component. 4,983,184, Cl. 623-66.000.

Steiner, Solomon S., to Clinical Technologies Associates, Inc. Orally administerable ANF. 4,983,402, Cl. 424-491.000.

Stelco, Inc.: *See—*
Mitchell, John S., 4,982,936, Cl. 266-249.000.

Stepanenko, Alexandr V.; Vereschagin, Mikhail N.; Paly, Oleg I.; Sheleg, Valery K.; Kaptsevich, Vyacheslav M.; Gorunov, Valery E.; Lapitsky, Evgeny A.; Kostornov, Anatoly G.; and Kholomeev, Alexandr V. Method of producing metal filament and apparatus materializing same. 4,982,780, Cl. 164-463.000.

Stephens, Joseph R.: *See—*
Hebsur, Mohan G.; and Stephens, Joseph R., 4,983,358, Cl. 420-425.000.

Stephens, William F. N., to Renishaw plc. Opto electronic scale reading apparatus wherein each of a plurality of detectors receives light from a corresponding emitter of a plurality of light emitters. 4,983,828, Cl. 250-237.00G.

Stephenson, Samuel H.: *See—*
Grebinski, Thomas J., Jr.; and Stephenson, Samuel H., 4,982,753, Cl. 134-95.000.

Steppe, Dennis L.; and Haines, Stephen W., to Nestle S.A. Rigid transparent fluid conduit for ophthalmic surgical irrigation. 4,983,160, Cl. 604-22.000.

Stevens David R.; and Marziali, Andrea, to University of British Columbia, The. XY velocity controller. 4,983,786, Cl. 178-18.000.

Stevens, Eric G., to Eastman Kodak Company. Solid-state image sensor. 4,984,047, Cl. 357-30.000.

Stevens, Mark T., to CSA Inc. Point-of-purchase stationery. 4,982,839, Cl. 206-215.000.

Stewart, James L.; Ketchum, Susan K.; and Stumpf, Robert J., to Abbott Laboratories. Immunoassay for HIV-I antigens using $F(AB')_2$ fragments as probe. 4,983,529, Cl. 436-512.000.

Stewart, John V. Sidewalk liter. 4,982,930, Cl. 254-124.000.

Stewart, Peter A. E.; Skelton, Richard T.; Allen, Martin J.; and Douglas, Joseph, to Rolls-Royce plc. Non-invasive inspection. 4,983,841, Cl. 250-358.100.

Stiefel, Hans-Peter; and Frank, Kurt, to Robert Bosch GmbH. Air metering device. 4,982,602, Cl. 73-118.200.

Stiepel, Norbert M.; Thompson, Edwin; and Anderson, Luis, to Sensormatic Electronics Corporation. Outdoor surveillance dome with enhanced environmental aptitude and control system therefor. 4,984,089, Cl. 358-229.000.

Stihl, Andreas: *See*—
Harbeke, Jorg, 4,983,330, Cl. 261-52.000.

Stobb Inc.: *See*—
Stobb, Walter J., 4,983,155, Cl. 493-369.000.

Stobb, Walter J., to Stobb Inc. Paper web cutter. 4,983,155, Cl. 493-369.000.

Stokes, Vijay K., to General Electric Company. High temperature, high pressure continuous random glass fiber reinforced thermoplastic fluid vessel and method of making. 4,982,856, Cl. 220-3.000.

Stollco Industries Ltd.: *See*—
Stolle, Klaus; and Schoeffel, Gerd, 4,982,547, Cl. 52-656.000.

Stolle, Klaus; and Schoeffel, Gerd, to Stollco Industries Ltd. Corner connector for hollow extrusions. 4,982,547, Cl. 52-656.000.

Stone Container Corporation: *See*—
Kelley, Robert G.; VanAusdal, R. Phillip; and Wadium, Christopher S., 4,982,873, Cl. 222-77.000.

Stone, Earlyn. Steamer. 4,982,656, Cl. 99-403.000.

Stone, William E. E.: *See*—
Lardinois, Pierre F.; Rouxhet, Paul G.; Stone, William E. E.; Baker, Kenneth M.; and Baudichau, Alain E., 4,983,510, Cl. 435-4.000.

Storm, David A.: *See*—
Wong, Suk-Fun; Storm, David A.; and Patel, Mahendra S., 4,983,638, Cl. 518-714.000.

Stotka, David M., to Ciba-Geigy Corporation. Method of molding enamel coated glass sheet without adhesion to die. 4,983,196, Cl. 65-24.000.

Straight, Michael R.; and Roinestad, Gerald C., to Ashworth Bros., Inc. Exit rail assembly for helical conveyor belts. 4,982,833, Cl. 198-778.000.

Straihammer, Reinhard; Schuss, Werner; Goisser, Siegfried; and Beerstecher, Lutz, to Siemens Aktiengesellschaft. Dental handpiece. 4,983,121, Cl. 433-114.000.

Strangman, Thomas E.: *See*—
Ruckle, Duane L.; Strangman, Thomas E.; and Keiser, Robert J., 4,982,893, Cl. 228-220.000.

Stranzke, Gunter; Weber, Rolf D.; and Jenter, Erich, to Saurer-Allma GmbH. Upward twisting machine, in particular double twisting machine. 4,982,561, Cl. 57-62.000.

Strecker, Claus: *See*—
Klein, Wolfdieter; Strecker, Claus; Feuchthofen, Alfons; and Boenisch, Ulrich, 4,983,279, Cl. 208-413.000.

Streicher, Rolf; Schaffer, Ortwin; Belde, Horst; and Guenthert, Paul, to BASF Aktiengesellschaft. Dyeing of leather with pigments. 4,983,185, Cl. 8-436.000.

Streifer, William: *See*—
Scifres, Donald R.; Welch, David F.; Endriz, John; and Streifer, William, 4,984,242, Cl. 372-45.000.

Strobl, Georg, to Johnson Electric S.A. Commutator with base alignment interlock. 4,983,871, Cl. 310-234.000.

Strobl, Georg, to Johnson Electric S.A. Brush gear for a permanent magnet motor. 4,983,872, Cl. 310-239.000.

Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal and plant growth-regulating hydroxyalkylazolyl derivatives. 4,983,208, Cl. 71-92.000.

Stromback, Gustav M. Economical steel roof truss. 4,982,545, Cl. 52-639.000.

Strong, Michael D.; Zimmerman, Charles E.; and Kiapokas, Michael G., to AMP Incorporated. Product feeding apparatus. 4,982,830, Cl. 198-349.600.

Stroze, Mark S.; and Spurbeck, Kenneth C., to Sundstrand Corporation. Constant velocity joint for hydraulic actuator in an airframe. 4,983,141, Cl. 464-7.000.

Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Fungicides and plant-growth controlling agents. 4,983,207, Cl. 71-88.000.

Strutzel, Jon L.: *See*—
Tsang, Tsze H.; and Strutzel, Jon L., 4,983,590, Cl. 514-64.000.

Stryker, Virginia H.: *See*—
Wagner, Frederick W.; Dean, Maria A.; de la Motte, Rebecca S.; and Stryker, Virginia H., 4,983,731, Cl. 536-127.000.

Stuetz, Dagobert E.: *See*—
Choe, Eui W.; Buckley, Alan; Stuetz, Dagobert E.; and Garito, Anthony F., 4,983,325, Cl. 252-600.000.

Stumpf, Robert J.: *See*—
Stewart, James L.; Ketchum, Susan K.; and Stumpf, Robert J., 4,983,529, Cl. 436-512.000.

Stumpf, William R.: *See*—
Somers, Robert I.; Harman, William G., Jr.; O'Hara, Frank; and Stumpf, William R., 4,983,080, Cl. 408-241.00R.

Stumpp, Michael; Neumann, Peter; and Eilingsfeld, Heinz, to BASF Aktiengesellschaft. Preparation of bis-(4-chlorophenyl) sulfone. 4,983,773, Cl. 568-034.000.

Sturzebecher, Claus-Steffen: *See*—
Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; Sturzebecher, Claus-Steffen; and Elger, Walter, 4,983,629, Cl. 514-530.000.

Stutzenberger, Heinz, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,982,708, Cl. 123-297.000.

Su, Wei-Yang: *See*—
Knifton, John F.; and Su, Wei-Yang, 4,983,565, Cl. 502-242.000.

Sublett, Bobby J.; and Beavers, Randy S., to Eastman Kodak Company. Copolyesters and articles extrusion blow-molded therefrom. 4,983,711, Cl. 528-272.000.

Subramanian, Munirpallam A.: *See*—
Bolt, John D.; and Subramanian, Munirpallam A., 4,983,573, Cl. 505-1.000.

Sueyoshi, Masahiko: *See*—
Yokota, Chitoshi; Kawano, Minoru; Sueyoshi, Masahiko; Nishida, Toshiro; Setoguchi, Shohachi; and Fujimoto, Akira, 4,982,984, Cl. 292-201.000.

Suezaki, Hideaki: *See*—
Tsutsumi, Yasutsugu; Tanaka, Sueyoshi; Takahashi, Tatsuro; Morita, Yutaka; Suezaki, Hideaki; and Yamada, Hiromichi, 4,983,111, Cl. 425-110.000.

Suga, Mitsuhiro; and Takizawa, Akio, to Nippon Antenna Co., Ltd. Mechanism for controlling electrically driven antenna. 4,983,892, Cl. 318-98.000.

Suga, Shigeru; and Mitsuhashi, Kenhachi, to Suga Test Instruments Co., Ltd.; and Yokohama Rubber Co., Ltd. Method of measuring and controlling ozone concentration. 4,983,526, Cl. 436-55.000.

Suga Test Instruments Co., Ltd.: *See*—
Suga, Shigeru; and Mitsuhashi, Kenhachi, 4,983,526, Cl. 436-55.000.

Sugahara, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Exposure device for forming phosphor deposited screen in in-line cathode ray tube. 4,983,995, Cl. 354-1.000.

Sugano, Toshio; Tsukui, Seiichirou; and Suzuki, Shigeru, to Hitachi, Ltd.; and Hitachi Tobu Semiconductor, Ltd. Semiconductor device. 4,984,064, Cl. 357-80.000.

Sugata, Masao; Masaki, Tatsuo, deceased (by Masaki, Yoshiko, legal successor); Komuro, Hirokazu; Hirasawa, Shinichi; and Yano, Yasuhiro, to Canon Kabushiki Kaisha. Thermal recording head. 4,983,993, Cl. 346-76.0PH.

Sugawara, Hayato: *See*—
Ohta, Kenji; Horikoshi, Shigeru; and Sugawara, Hayato, 4,982,710, Cl. 123-399.000.

Sugaya, Ritsuo: *See*—
Hanatani, Syuichi; Akagi, Masanobu; Nigo, Kouemon; Sugaya, Ritsuo; and Shibuya, Toshiteru, 4,984,154, Cl. 364-200.000.

Suggitt, Robert M.: *See*—
McMahon, Matthew A.; Suggitt, Robert M.; McKeon, Ronald J.; and Brent, Albert, 4,983,296, Cl. 210-603.000.

Sugi, Hideo: *See*—
Kondo, Nobuo; Kikuchi, Masahiro; Nakajima, Tsunetaka; Watanabe, Masahiro; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 4,983,605, Cl. 514-247.000.

Sugibayashi, Tadahiko, to NEC Corporation. Semiconductor memory device with improved indicator of state of redundant structure. 4,984,205, Cl. 365-200.000.

Sugihara, Eiichi: *See*—
Ueki, Toru; Sentoku, Hajime; Miyazaki, Takashi; and Sugihara, Eiichi, 4,983,435, Cl. 428-36.600.

Sugimoto, Tasuku: *See*—
Mizuno, Toshiaki; Kimura, Shinji; Sugiura, Toshiaki; Sakuma, Mikio; Sugimoto, Tasuku; and Imaizumi, Mamoru, 4,983,854, Cl. 250-561.000.

Sugino, Kimihiro; and Satoh, Mitsumasa, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. A/D converter. 4,983,975, Cl. 341-166.000.

Sugino, Morihiko; and Inoue, Yoshio, to Kabushiki Kaisha Kobe Seiko Sho. Carbon fiber-reinforced carbon composite material and process for producing the same. 4,983,451, Cl. 422-283.000.

Sugita, Tatsuya: *See*—
Kawaguchi, Susumu; Shirafuji, Yoshinori; Maeyama, Hideaki; Sugita, Tatsuya; and Yamamoto, Takashi, 4,983,108, Cl. 418-63.000.

Sugiura, Ikuzo: *See*—
Uchimura, Mitsuo; Koike, Seiji; Koizumi, Osamu; Tashiro, Takeshi; Fushimi, Kazuhiro; and Sugiura, Ikuzo, 4,982,946, Cl. 271-251.000.

Sugiura, June: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,984,212, Cl. 365-230.030.

Sugiura, Rikio: *See*—
Kubota, Akihiro; Sugiura, Rikio; Aoki, Tsuyoshi; and Ono, Michio, 4,984,059, Cl. 357-68.000.

Sugiura, Shinji: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Oosumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.

Sugiura, Toshiaki: *See*—
Mizuno, Toshiaki; Kimura, Shinji; Sugiura, Toshiaki; Sakuma, Mikio; Sugimoto, Tasuku; and Imaizumi, Mamoru, 4,983,854, Cl. 250-561.000.

Sugiyama, Fumio: *See*—
Watanabe, Toshiaki; and Sugiyama, Fumio, 4,984,076, Cl. 358-133.000.

Sugiyama, Kenji; Katayama, Yasuyuki; Suzuki, Nobuyuki; Uchida, Tomoaki; and Kouguchi, Tatsuhi, to Victor Company of Japan, Ltd. Motion-adaptive device for separating luminance signal and color signal. 4,984,068, Cl. 358-31.000.

Sugiyama, Masanori; Shirai, Takao; Masutani, Takayoshi; and Yoshikawa, Isao, to Aisin Seiki Kabushiki Kaisha. System for driving and controlling an open-area shield. 4,983,896, Cl. 318-286.000.

Sugiyama, Moto: *See—*
Marasco, Joseph; and Sugiyama, Moto, 4,982,945, Cl. 271-213.000.
Sukhareva, Natalya I.: *See—*
Fedorov, Svyatoslav N.; Linnik, Leonid F.; Sukhareva, Natalya I.; and Korotkov, Igor I., 4,982,969, Cl. 279-1.00R.
Sullivan, James B.: *See—*
Evans, Joseph M.; Moore, E. Rex; and Sullivan, James B., 4,984,127, Cl. 361-179.000.
Sultan, Bernard; and Muraz, Pierre. Sterile container for collecting biological samples for purposes of analysis. 4,982,615, Cl. 73-864.510.
Sumitomo Bakelite Company Limited: *See—*
Yagata, Kazuhiko; and Noguchi, Yasuo, 4,982,735, Cl. 128-204.230.
Sumitomo Chemical Company, Limited: *See—*
Aoshima, Masashi; Shigematu, Hironobu; and Sato, Mitsuhiko, 4,983,685, Cl. 525-331.800.
Oda, Yoshiaki; Ikeda, Takaharu; and Yamachika, Hiroshi, 4,983,758, Cl. 560-105.000.
Sasaki, Toshio; Sogabe, Eiji; and Ebara, Takeshi, 4,983,561, Cl. 502-107.000.
Sumitomo Electric Industries, Ltd.: *See—*
Saito, Kazuhito; Kakii, Toshiaki; Ishida, Hidetoshi; and Suzuki, Shuzo, 4,983,012, Cl. 350-96.210.
Shibano, Yoshizo; Suzuki, Haruo; and Iwai, Tohru, 4,983,984, Cl. 343-711.000.
Taguchi, Tsunemasa; and Nanba, Hirokuni, 4,983,249, Cl. 156-603.000.
Summers, Roger L., to Bridgestone/Firestone, Inc. Conveyor belt and guiding system therefor. 4,982,836, Cl. 198-838.000.
Sumner, Anthony J. M.: *See—*
Holroyd, Eric; Holroyd, Colin; Sumner, Anthony J. M.; and Wright, Anthony R., 4,983,239, Cl. 156-123.000.
Sunaga, Takashi: *See—*
Kaneko, Masato; Takagi, Minoru; Sunaga, Takashi; Komatsubara, Takeo; and Mutoh, Taira, 4,983,313, Cl. 252-68.000.
Sunami, Hideo; Kure, Tokuo; Kawamoto, Yoshifumi; Tamura, Masao; and Miyao, Masanobu, to Hitachi, Ltd. Vertical MOSFET DRAM. 4,984,030, Cl. 357-23.600.
Sunami, Hideo; Ohkura, Makoto; Miyao, Masanobu; Kusukawa, Kikuo; Moniwa, Masahiro; Kimura, ShinIchiro; Warabisako, Terunori; and Kure, Tokuo, to Hitachi, Ltd. Semiconductor memory and method of producing the same. 4,984,038, Cl. 357-23.600.
Sunami, Sadakatsu. Car theft proofing system. 4,983,948, Cl. 340-426.000.
Sunami, Sadakatsu. Car theft proofing system. 4,983,950, Cl. 340-426.000.
Sundstrand Corporation: *See—*
Palaniappan, Rasappa; and Dhyanchand, John J., 4,983,902, Cl. 318-701.000.
Stroze, Mark S.; and Spurbeck, Kenneth C., 4,983,141, Cl. 464-7.000.
Tsai, Shan-chin, 4,983,099, Cl. 417-222.000.
Vaidya, Jayant; and Mokadam, Raghunath G., 4,983,869, Cl. 310-90.500.
Sunstar Giken Kabushiki Kaisha: *See—*
Nakata, Yoshihiro; and Kunishige, Tadao, 4,983,655, Cl. 524-101.000.
Sunstar Kabushiki Kaisha: *See—*
Hasegawa, Kenji; Nakashima, Nakashima; Eguchi, Toru; and Masako, Ota, 4,983,385, Cl. 424-78.000.
Suntory Limited: *See—*
Fujikawa, Shigeaki; Koga, Kunimasa; and Yokota, Tomoko, 4,983,524, Cl. 435-174.000.
Survival Technology, Inc.: *See—*
Fournier, Donald J.; and Jacobs-Perkins, Douglas W., 4,982,769, Cl. 141-98.000.
Susumu, Ikeda, to Sanden Corporation. Temperature control device for a refrigerating container. 4,982,582, Cl. 62-115.000.
Sutton, Fred A.; and Ratzlaff, Marc H., to Technology Innovations, Inc. Recoil shock relieving pad for rifles. 4,982,521, Cl. 42-74.000.
Suyama, Takahiro: *See—*
Yamamoto, Saburo; Morimoto, Taiji; Sasaki, Kazuaki; Kondo, Masaki; Suyama, Takahiro; and Kondo, Masafumi, 4,984,244, Cl. 372-461.000.
Suzuki, Akihiro: *See—*
Suzuki, Makoto; Yamada, Shoji; Taki, Kazunari; and Suzuki, Akihiro, 4,983,499, Cl. 430-321.000.
Suzuki, Akira: *See—*
Hibino, Hiroki; Nagayama, Yoshikatsu; Yoshikawa, Mutsumi; Takara, Toshiyuki; Goto, Masahito; Suzuki, Akira; Takehana, Sakae; Oaki, Yoshinao; Yoshimitsu, Koichi; and Aoki, Yoshisada, 4,982,725, Cl. 128-4.000.
Suzuki, Haruo: *See—*
Shibano, Yoshizo; Suzuki, Haruo; and Iwai, Tohru, 4,983,984, Cl. 343-711.000.
Suzuki, Hiromasa: *See—*
Ikuno, Yuki; Nishikori, Toshiaki; Miyazaki, Akihiko; Nakamura, Kazunari; Onada, Fumiyuki; Suzuki, Hiromasa; Nakamura, Takeaki; Oaki, Yoshinao; Kidawara, Atsushi; Kanno, Masahide; Yabe, Hisao; and Katoh, Shinichi, 4,983,019, Cl. 350-313.000.
Suzuki, Kaoru; Kaneko, Mamoru; and Kanari, Matsukichi, to Hitachi, Ltd.; and Hitachi Electronics Service Co., Ltd. Automatic verification system for maintenance/diagnosis facility in computer system. 4,984,239, Cl. 371-3.000.
Suzuki, Katsuhisa; and Matsubayashi, Hiroshi, to Showa Aluminum Corporation. Evaporator. 4,982,579, Cl. 62-515.000.
Suzuki, Katsuhisa: *See—*
Yoshida, Masashi; Suzuki, Katsuhisa; and Yoshikawa, Masaaki, 4,983,293, Cl. 210-500.230.
Suzuki, Koji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic range finder for camera. 4,983,033, Cl. 356-4.000.
Suzuki, Koji: *See—*
Miyake, Haruhisa; Ito, Hiroaki; Suzuki, Koji; and Yamada, Ryoji, 4,983,264, Cl. 204-98.000.
Suzuki, Makoto; Yamada, Shoji; Taki, Kazunari; and Suzuki, Akihiro, to Brother Kogyo Kabushiki Kaisha. Method of forming waveguide lens having refractive index distribution. 4,983,499, Cl. 430-321.000.
Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Slide switch. 4,983,795, Cl. 200-550.000.
Suzuki, Masayoshi: *See—*
Gokan, Hiroshi; Mukainaru, Masahito; Suzuki, Masayoshi; Tsuge, Hisanao; and Matsuya, Hidehiko, 4,983,545, Cl. 437-228.000.
Suzuki, Motokazu: *See—*
Hagino, Sadaaki; Suzuki, Motokazu; Nishikawa, Shigeru; and Hayashi, Kenichi, 4,983,576, Cl. 505-1.000.
Suzuki, Nobuyuki: *See—*
Sugiyama, Kenji; Katayama, Yasuyuki; Suzuki, Nobuyuki; Uchida, Tomoaki; and Kouguchi, Tatsushi, 4,984,068, Cl. 358-31.000.
Suzuki, Shigeru: *See—*
Nomura, Etsuzo; Takeuchi, Hirokasu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,982,677, Cl. 112-314.000.
Sugano, Toshio; Tsukui, Seiichirou; and Suzuki, Shigeru, 4,984,064, Cl. 357-80.000.
Suzuki, Shuzo: *See—*
Saito, Kazuhito; Kakii, Toshiaki; Ishida, Hidetoshi; and Suzuki, Shuzo, 4,983,012, Cl. 350-96.210.
Suzuki, Tadashi: *See—*
Adachi, Hideki; Tomosada, Masahiro; Suzuki, Tadashi; and Ohki, Naoyuki, 4,984,020, Cl. 355-218.000.
Suzuki, Yukio; Masuda, Ikuro; Iwamura, Masahiro; Kadono, Shinji; Uragami, Akira; Yoshimura, Masayoshi; and Matsubara, Toshiaki, to Hitachi, Ltd. Semiconductor integrated circuit with a bi-MOS input circuit for providing input signals to an internal logic block. 4,983,862, Cl. 307-446.000.
Suzuki, Yukio: *See—*
Yasuda, Yoshizumi; Wada, Nobuaki; Suzuki, Yukio; and Watai, Haruhisa, 4,983,263, Cl. 204-44.200.
Sverdrup Technology, Inc.: *See—*
Hebsur, Mohan G.; and Stephens, Joseph R., 4,983,358, Cl. 420-425.000.
Swagelok-Quick Connect Co.: *See—*
Kreczko, Gregory; and Wagner, Ross L., 4,982,761, Cl. 137-614.030.
Swain, Danny C. Self-enclosed filter pumping system. 4,983,102, Cl. 417-394.000.
Swanick, David J.: *See—*
Huntley, William P.; and Swanick, David J., 4,983,983, Cl. 342-443.000.
Swart, Mark A.; and Johnston, Charles J., to Everett/Charles Contact Products, Inc. Repetitive-switching. 4,983,909, Cl. 324-158.00P.
Sweeny, Henry D., to Swenco Limited. Auxiliary handle. 4,982,989, Cl. 294-171.000.
Swenco Limited: *See—*
Sweeny, Henry D., 4,982,989, Cl. 294-171.000.
Swing Maker, Incorporated: *See—*
Fazio, Jerry J.; Jackson, E. Wayne, III; and Legere, David E., 4,982,963, Cl. 273-186.00A.
Swisher, Beth A.: *See—*
Markley, Lowell D.; Hamilton, Christopher T.; Swisher, Beth A.; and Secor, Jacob, 4,983,211, Cl. 71-94.000.
Swiss Aluminium Ltd.: *See—*
Mier, Gerhard, 4,982,497, Cl. 29-599.000.
Symtron Systems, Inc.: *See—*
Ernst, James J.; Williamson, Steven; Rogers, George; and Musto, Dominick J., 4,983,124, Cl. 434-226.000.
Syntex (U.S.A.) Inc.: *See—*
Benjamin, Eric; Anik, Shabbir; and Lin, Ya-Yun T., 4,983,595, Cl. 514-174.000.
O'Yang, Counde; Kurz, Walter; Walker, Keith A. M.; and Wu, Helen Y., 4,983,627, Cl. 514-510.000.
Synthelabo: *See—*
Cavero, Icilio; Elkik, Francois; Hicks, Peter; and Muller, Jean-Claude, 4,983,598, Cl. 514-211.000.
Manoury, Philippe; Obitz, Daniel; Peynot, Michel; and Frost, Jonathan, 4,983,607, Cl. 514-253.000.
Synthetic Products Company: *See—*
Jennings, Thomas C.; and Tanno, David M., 4,983,688, Cl. 525-389.000.
Systems Technology, Inc.: *See—*
Smith, James C.; Allen, R. Wade; and Jex, Henry R., 4,983,125, Cl. 434-258.000.
Szabo, Stephan L., to S. Szabo AG. Apparatus for applying of an adhesive for floor coverings. 4,982,470, Cl. 15-104.00S.
Szucs, Attila: *See—*
Szucz, Laszlone ; and Szucs, Attila, 4,983,301, Cl. 210-636.000.
Szucz, Laszlone ; and Szucs, Attila. Method and apparatus for treating fluids containing foreign materials by membrane filter equipment. 4,983,301, Cl. 210-636.000.
Tabasky, Marvin J.: *See—*
Bulat, Emel S.; and Tabasky, Marvin J., 4,983,536, Cl. 437-40.000.

Tabuchi, Hiroaki: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Tabushi, Ichiro: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Oosumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.

Tachibana, Takeshi: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Tada, Tetsuo; and Takagi, Ryouichi, to Mitsubishi Denki Kabushiki Kaisha. Probing card for wafer testing and method of manufacturing the same. 4,983,908, Cl. 324-158.00P.

Tadenuma, Hiroshi: *See*—
Ito, Toshiyuki; Ikeda, Yorinobu; Watanabe, Yasuhisa; and Tadenuma, Hiroshi, 4,983,656, Cl. 524-109.000.

Tadokoro, Joji: *See*—
Konishi, Hiroshi; Noguchi, Matsusaburo; Tadokoro, Joji; and Otaki, Noboru, 4,982,942, Cl. 271-119.000.

Taguchi, Kazuo; and Honma, Yoshiaki, to Juki Corporation. Profile stitcher. 4,982,675, Cl. 112-121.120.

Taguchi, Tsunemasa; and Nanba, Hirokuni, to Production Engineering Association; and Sumitomo Electric Industries, Ltd. Method for producing semiconductive single crystal. 4,983,249, Cl. 156-603.000.

Tahara, Kazuo: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.

Tahara, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Magnetic shim for magnetic field correction. 4,983,922, Cl. 324-320.000.

Taipale, Seppo; and Hakkarainen, Merja, to Tamfelt Oy Ab. Paper machine fabric. 4,982,766, Cl. 139-383.00A.

Taira, Daijiro, to Kabushiki Kaisha Toshiba. Electronic endoscope system with suction channel of controllable strength of suction. 4,982,726, Cl. 128-4.000.

Tajiri, Noriyuki: *See*—
Yoshida, Tomohiko; Handa, Ryoji; Tajiri, Noriyuki; Iwasaki, Hitochi; and Yoshihiro, Mituto, 4,983,660, Cl. 524-369.000.

Takada, Mitsuru; Itoh, Hiroshi; Takahashi, Tokuyuki; and Funahashi, Makoto, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control device for automatic transmission for vehicle having friction engaging means operative in two jumping apart speed stages. 4,982,624, Cl. 74-869.000.

Takagi, Minoru: *See*—
Kaneko, Masato; Takagi, Minoru; Sunaga, Takashi; Komatsubara, Takeo; and Mutoh, Taira, 4,983,313, Cl. 252-68.000.

Takagi, Ryouichi: *See*—
Tada, Tetsuo; and Takagi, Ryouichi, 4,983,908, Cl. 324-158.00P.

Takagi, Tadao, to Nikon Corporation. Exposure control apparatus for camera. 4,984,007, Cl. 354-432.000.

Takagi, Yuji: *See*—
Satoh, Isao; Fukushima, Yoshihisa; Takagi, Yuji; and Azumatani, Yasushi, 4,984,230, Cl. 369-54.000.

Takahashi, Hideaki: *See*—
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,984,212, Cl. 365-230.030.

Takahashi, Jun, to Ohi Seisakusho Co., Ltd. Lid regulating device for sun roof structure. 4,982,995, Cl. 296-221.000.

Takahashi, Junji: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Takahashi, Ken: *See*—
Kanzawa, Ryosaku; Takahashi, Ken; Sano, Hisumi; and Kurata, Kazuhiro, 4,984,035, Cl. 357-17.000.

Takahashi, Kenro: *See*—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu; Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, 4,982,979, Cl. 280-707.000.

Takahashi, Minoru: *See*—
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Takahashi, Mitsuharu, to Kabushiki Kaisha Sato. Tag size differentiating system for continuous tag printing machines. 4,982,887, Cl. 226-24.000.

Takahashi, Osamu; Naruse, Hideaki; Morigaki, Masakazu; Ohki, Nobutaka; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 4,983,507, Cl. 430-551.000.

Takahashi, Satomi: *See*—
Inoue, Kenji; Takahashi, Satomi; Yonetsu, Keiichi; and Ueyama, Noboru, 4,983,759, Cl. 500-174.000.

Takahashi, Shinsuke; Shibata, Norio; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Method and apparatus for manufacturing magnetic recording medium. 4,982,687, Cl. 118-410.000.

Takahashi, Susumu: *See*—
Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, 4,983,532, Cl. 437-31.000.

Takahashi, Tadashi: *See*—
Miyashita, Kunio; Hayashida, Hiroshi; Takahashi, Tadashi; and Kawamata, Syooichi, 4,983,893, Cl. 318-135.000.

Takahashi, Takao; and Nakano, Kenji, to Sony Corporation. Apparatus for recording an information signal at a second part of a given track by sampling and holding a tracking control signal used for tracking at a first part of the given track. 4,984,104, Cl. 360-77.140.

Takahashi, Tatsuro: *See*—
Tsutsumi, Yasutsugu; Tanaka, Sueyoshi; Takahashi, Tatsuro; Morita, Yutaka; Suezaki, Hideaki; and Yamada, Hiromichi, 4,983,111, Cl. 425-110.000.

Takahashi, Tokuyuki: *See*—
Takada, Mitsuru; Itoh, Hiroshi; Takahashi, Tokuyuki; and Funahashi, Makoto, 4,982,624, Cl. 74-869.000.

Takahashi, Toshihiro; Ito, Koichi; and Tobita, Hideyuki, to Hitachi, Ltd. Method for operating washing machine. 4,982,468, Cl. 8-159.000.

Takahashi, Toshihisa; Uchinami, Masanobu; Nishida, Shinichi; and Inoue, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Air-fuel control apparatus for an internal combustion engine. 4,982,714, Cl. 123-488.000.

Takahashi, Tsuyoshi; Kawamura, Katsumi; Naruse, Jun; and Shimizu, Jyousei, to Hitachi, Ltd. Rotary actuator and bearing support therefor. 4,984,115, Cl. 360-106.000.

Takahata, Fujiya: *See*—
Ohki, Hiroshi; Miyake, Ryo; Yamazaki, Isao; and Takahata, Fujiya, 4,983,038, Cl. 356-246.000.

Takahata, Haruo: *See*—
Uchida, Katsuyuki; and Takahata, Haruo, 4,983,944, Cl. 338-22.00R.

Takamine, Jun, to Tokyo Electron Limited. Image reading apparatus. 4,983,842, Cl. 250-358.100.

Takano, Fumio: *See*—
Nakamura, Eitaro; Yamakawa, Masahiro; Nakayama, Akira; and Takano, Fumio, 4,983,311, Cl. 252-62.540.

Takano, Yuichi: *See*—
Takeda, Keiso; Kawai, Taiyo; Nakanishi, Kiyoshi; Ujihashi, Michiaki; and Takano, Yuichi, 4,982,716, Cl. 123-531.000.

Takara Co., Ltd.: *See*—
Satoh, Yasuta; Nakane, Shigeru; and Yoneyama, Hitoshi, 4,983,890, Cl. 318-3.000.

Takara, Toshiyuki: *See*—
Hibino, Hiroki; Nagayama, Yoshikatsu; Yoshikawa, Mutsumi; Takara, Toshiyuki; Goto, Masahito; Suzuki, Akira; Takehana, Sakae; Oaki, Yoshinao; Yoshimitsu, Koichi; and Aoki, Yoshisada, 4,982,725, Cl. 128-4.000.

Takaya, Tsuguo: *See*—
Yatagai, Hidetaka; Iriguchi, Jiro; Yamada, Souichi; and Takaya, Tsuguo, 4,983,710, Cl. 528-258.000.

Takayama, Makoto; Sakata, Tsuguhide; and Muramoto, Tomotaka, to Canon Kabushiki Kaisha. Video signal processing apparatus having delay means for varied uses. 4,984,095, Cl. 358-336.000.

Takayama, Norikazu; Ushijima, Nobuyoshi; Kobashi, Tetsuzo; Sato, Masahiko; Yano, Yoshihiko; Isozaki, Jun; Fujii, Kousuke; and Kudoh, Yoshinobu, to Hitachi, Ltd. Magnetic disk apparatus. 4,984,100, Cl. 360-49.000.

Takayanagi, Takashi; and Kawaguchi, Hideo, to Fuji Photo Film Co., Ltd. Process for producing cells for liquid crystal display devices. 4,983,429, Cl. 428-001.000.

Takeda Chemical Industries, Ltd.: *See*—
Yukio, Fujisawa; Yasuaki, Itoh; Osamu, Nishimura; and Tomoko, Fujii, 4,983,520, Cl. 435-69.300.

Takeda, Keiso; Kawai, Taiyo; Nakanishi, Kiyoshi; Ujihashi, Michiaki; and Takano, Yuichi, to Toyota Jidosha Kabushiki Kaisha. Fuel injection valve with an air assist adapter for an internal combustion engine. 4,982,716, Cl. 123-531.000.

Takeda, Masami: *See*—
Shigemoto, Hiromi; Takeda, Masami; and Muro, Tsuneaki, 4,983,674, Cl. 525-97.000.

Takeda, Shigeru: *See*—
Kinoshita, Yasuaki; Kubota, Sadami; and Takeda, Shigeru, 4,983,937, Cl. 333-202.000.

Takeda, Yoichi: *See*—
Kanazawa, Hirotaka; Takeda, Yoichi; Noguchi, Yukio; Chikuma, Isamu; Shimada, Satoru; and Chikaraishi, Kazuo, 4,982,804, Cl. 180-140.000.

Takeda, Yoshimitsu; Mochida, Haruo; Kanai, Toshio; and Masaki, Mikio, to Nissan Motor Company, Ltd.; and Kinzoku Kogyo Kabushiki Kaisha. Steering lock system. 4,982,584, Cl. 70-252.000.

Takehana, Sakae: *See*—
Hibino, Hiroki; Nagayama, Yoshikatsu; Yoshikawa, Mutsumi; Takara, Toshiyuki; Goto, Masahito; Suzuki, Akira; Takehana, Sakae; Oaki, Yoshinao; Yoshimitsu, Koichi; and Aoki, Yoshisada, 4,982,725, Cl. 128-4.000.

Takei, Hirosi: *See*—
Nakano, Akio; and Takei, Hirosi, 4,983,642, Cl. 521-88.000.

Takemoto Yushi Kabushiki Kaisha: *See*—
Kinoshita, Tsukasa; and Kato, Tomohiro, 4,983,309, Cl. 252-8.600.

Takemura, Masakazu; Honda, Hironori; and Terasaka, Masayuki, to Sanyo Electric Co., Ltd. Cadmium non-sintered negative electrode for an alkaline storage cell and its manufacturing method. 4,983,477, Cl. 429-222.000.

Takeo, Hideya, to Fuji Photo Film Co., Ltd. Method for detecting prospective contour points of an irradiation field. 4,983,835, Cl. 250-327.200.

Takeshima, Yoshinobu: *See*—
Nakazawa, Takeshi; Hashimoto, Jun; Nakamura, Shinichi; Yamazaki, Katsumi; Nakajima, Yoshihiro; Hayashi, Tsutomu; Ichikawa, Tetsuya; Yakigaya, Nobuyuki; Katahira, Kiyoshi; and Takeshima, Yoshinobu, 4,984,161, Cl. 364-424.100.

Takeuchi, Hirokasu: *See*—
Nomura, Etsuzo; Takeuchi, Hirokasu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,982,677, Cl. 112-314.000.

Takeuchi, Setsuo; and Kochi, Mutsuyuki, to Rikagaku Kenkyusho Wako; and Kochi, Mutsuyuki. Composition and method of treating selected malignant conditions. 4,983,636, Cl. 514-699.000.

Takeuchi, Shinya: *See*—
Tsugita, Takashi; Takeuchi, Shinya; Doi, Koichi; and Kishimoto, Fumito, 4,983,304, Cl. 210-640.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,983,328, Cl. 260-404.500.

Takeuchi, Tsunezo: *See*—
Yoshikawa, Akira; and Takeuchi, Tsunezo, 4,982,939, Cl. 269-32.000.

Takeuchi, Yoshinori; Yamaguchi, Yuzo; Tanaka, Katsuyuki; Muranushi, Fumitaka; and Daito, Hiroshi, to Hitachi, Ltd. Flying head slider. 4,984,114, Cl. 360-103.000.

Takeya, Naoya; Honma, Kazuhiro; and Matsuda, Kiyofumi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Apparatus for three-dimensional viewing of magnetic resonance imaging tomograms. 4,983,004, Cl. 350-3.660.

Taki, Kazunari: *See*—
Suzuki, Makoto; Yamada, Shoji; Taki, Kazunari; and Suzuki, Akihiro, 4,983,499, Cl. 430-321.000.

Takizawa, Akio: *See*—
Suga, Mitsuhiro; and Takizawa, Akio, 4,983,892, Cl. 318-98.000.

Talley, Walter D., III, to Chrysler Corporation. Test device for vehicle roof stiffness. 4,982,609, Cl. 73-849.000.

Tamaki, Reiji: *See*—
Arima, Junichi; Hirata, Yoshihiro; Harada, Hiroshi; Furuta, Isao; Harada, Shigeru; and Tamaki, Reiji, 4,983,547, Cl. 437-246.000.

Tamaki, Yoichi: *See*—
Sagara, Kazuhiko; Kure, Tokuo; Murakami, Eiichi; Nakamura, Tohru; Miyao, Masanobu; Kondo, Masao; Ishizaka, Akitoshi; and Tamaki, Yoichi, 4,984,048, Cl. 357-34.000.

Tamba, Nobuo: *See*—
Miyaoka, Shuuichi; Tamba, Nobuo; Arai, Toshikazu; Higuchi, Hiroshi; and Higuchi, Hisayuki, 4,984,058, Cl. 357-68.000.

Tamfelt Oy Ab: *See*—
Taipale, Seppo; and Hakkarainen, Merja, 4,982,766, Cl. 139-383.00A.

Tamglass Oy: *See*—
Peltonen, Esko J., 4,983,201, Cl. 65-104.000.

Tamlyn, Robert: *See*—
Hiltebeitel, Nathan R.; Tamlyn, Robert; and Tomashot, Steven W., 4,984,214, Cl. 365-230.050.

Tamura, Koji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, to Daikin Industries, Ltd. Refrigerants. 4,983,312, Cl. 252-67.000.

Tamura, Masao: *See*—
Sunami, Hideo; Kure, Tokuo; Kawamoto, Yoshifumi; Tamura, Masao; and Miyao, Masanobu, 4,984,030, Cl. 357-23.600.
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 4,983,540, Cl. 437-110.000.

Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, to Hitachi Chemical Co., Ltd. Process for producing toner for electrophotography. 4,983,488, Cl. 430-137.000.

Tanagho, Emil E.: *See*—
Lue, Tom F.; Tanagho, Emil E.; Schmidt, Richard A.; and Gleason, Curtis A., 4,982,731, Cl. 128-79.000.

Tanaka, Katsuyuki: *See*—
Takeuchi, Yoshinori; Yamaguchi, Yuzo; Tanaka, Katsuyuki; Muranushi, Fumitaka; and Daito, Hiroshi, 4,984,114, Cl. 360-103.000.

Tanaka, Kimio: *See*—
Satoh, Takateru; Hashizume, Kenji; Sasaki, Morimasa; and Tanaka, Kimio, 4,984,120, Cl. 360-128.000.

Tanaka, Masakatsu: *See*—
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.

Tanaka, Masao: *See*—
Hiai, Atsuhiko; Wakimura, Kazuo; Tanaka, Masao; and Tanaka, Takao, 4,983,462, Cl. 428-432.000.

Tanaka, Minoru: *See*—
Yamasaki, Katuhiko; Tanaka, Minoru; and Sakamoto, Kenichiro, 4,983,115, Cl. 425-228.000.

Tanaka, Nobue: *See*—
Oishi, Yoshihiro; and Tanaka, Nobue, 4,982,751, Cl. 132-299.000.

Tanaka, Norikazu: *See*—
Hirai, Hideo; Ando, Masakatsu; Hashimoto, Yasuhiro; Fujimoto, Naoki; Tanaka, Norikazu; and Yamakawa, Susumu, 4,983,145, Cl. 474-117.000.

Tanaka, Noriyuki; and Morikane, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Electrical brush assembly. 4,983,873, Cl. 310-248.000.

Tanaka, Seiichi; and Kurihara, Kouichi, to Kabushiki Kaisha Toshiba. Picture quality improving apparatus capable of reducing deterioration of interpolated signal. 4,984,070, Cl. 358-36.000.

Tanaka, Shigeyoshi: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 4,983,488, Cl. 430-137.000.

Tanaka, Sueyoshi: *See*—
Tsutsumi, Yasutsugu; Tanaka, Sueyoshi; Takahashi, Tatsuro; Morita, Yutaka; Suezaki, Hideaki; and Yamada, Hiromichi, 4,983,111, Cl. 425-110.000.

Tanaka, Takahiko: *See*—
Okazaki, Susumu; Yamamoto, Takeshi; Kajimoto, Shinshi; Konishi, Takeshi; Hisanaga, Naogi; and Tanaka, Takahiko, 4,982,993, Cl. 296-192.000.

Tanaka, Takao: *See*—
Hiai, Atsuhiko; Wakimura, Kazuo; Tanaka, Masao; and Tanaka, Takao, 4,983,462, Cl. 428-432.000.

Tanaka, Teruhiko, to Kabushiki Kaisha Daikin Seisakusho. Friction device of lockup clutch. 4,982,821, Cl. 192-3.290.

Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetically operated switch. 4,983,941, Cl. 335-255.000.

Tanaka, Toshiyasu; Tsuzaki, Nozomi; and Kobayashi, Toyohiro, to Du Pont de Nemours, E. I., and Company. Optoelectrical connector device and optical plug socket therefor. 4,983,011, Cl. 350-96.200.

Tanaka, Yoshio; and Kawaguchi, Katsumi, to Kureha Chemical Industry Co., Ltd. Sterilization of vacuum packaged raw meat. 4,983,411, Cl. 426-234.000.

Tandberg Data AS: *See*—
Rudi, Guttorm, 4,984,111, Cl. 360-96.500.

Taneda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Interelectrode distance controlling device in electric discharge machining apparatus. 4,983,800, Cl. 219-69.160.

Tani, Nobuhiro; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure controlling apparatus for electronic still camera. 4,984,088, Cl. 358-228.000.

Tani, Yatsuhiro; Ohmori, Susumu; and Komagata, Hideki, to Toyo Koseki Kabushiki Kaisha; and Nippondenso Co., Ltd. Filter and process for the production thereof. 4,983,193, Cl. 55-487.000.

Tanigawa, Shigeho: *See*—
Endoh, Minoru; Nozawa, Yasuto; Iwasaki, Katsunori; Tanigawa, Shigeho; and Tokunaga, Masaaki, 4,983,232, Cl. 148-302.000.

Taniguchi, Keishi; and Yamaguchi, Junko, to Ricoh Company, Ltd. Thermal image transfer recording medium. 4,983,446, Cl. 428-216.000.

Taniguchi. Motoji, to Kanebo Ltd.; and Kanebo Engineering Ltd. Frictional electrostatic voltage measuring equipment. 4,983,923, Cl. 324-454.000.

Taniguchi, Toru, to Reica Corporation. Mixer. 4,983,045, Cl. 366-117.000.

Tanisake, Hiroka; Yamamoto, Koji; Hirota, Toshizumi; and Maruo, Kazunobu, to Mitsubishi Gas Chemical Company, Inc. Copolyester from 1,6-bis(phenoxy)hexane-4,4'-dicarboxylate. 4,983,707, Cl. 528-193.000.

Tanno, David M.: *See*—
Jennings, Thomas C.; and Tanno, David M., 4,983,688, Cl. 525-389.000.

Tanno, Masaya, to Sanyo Electric Co., Ltd. Logarithmic amplification circuit for obtaining output voltage corresponding to difference between logarithmically amplified values of two input currents. 4,983,863, Cl. 307-492.000.

Tanoue, Tomonori: *See*—
Mitani, Katsuhiko; Tanoue, Tomonori; Kusano, Chushirou; Takahashi, Susumu; Saito, Masayoshi; Miyazaki, Hiroshi; and Murai, Fumio, 4,983,532, Cl. 437-31.000.

Tarreau, Michel: *See*—
Derenne, Philippe; Louis, Michel; Camous, Jacques; and Tarreau, Michel, 4,983,028, Cl. 350-609.000.

Tashima, Seiji: *See*—
Hashimoto, Takayoshi; Shibata, Masanori; Okimoto, Haruo; Tashima, Seiji; Yamada, Kaoru; Akagi, Toshimichi; Shimizu, Ritsuharu; Yamamoto, Masaru; and Ohmori, Masashi, 4,982,567, Cl. 60-600.000.

Tashiro, Takao; and Ishikawa, Osamu, to Viscodrive Japan Ltd. Differential gear apparatus with differential limitation mechanism. 4,983,150, Cl. 475-85.000.

Tashiro, Takeshi: *See*—
Uchimura, Mitsuo; Koike, Seiji; Koizumi, Osamu; Tashiro, Takeshi; Fushimi, Kazuhiro; and Sugiura, Ikuzo, 4,982,946, Cl. 271-251.000.

Tatematsu, Susumu; Tsukiyama, Yasumitsu; and Hida, Junichi, to Hoshizaki Denki Kabushiki Kaisha. Electric control apparatus for auger type ice making machine. 4,982,573, Cl. 62-135.000.

Tateno, Minoru; and Ide, Akira, to Hitachi, Ltd. Semiconductor memory device. 4,984,207, Cl. 365-208.000.

Tatsu Corporation Co., Ltd.: *See*—
Emori, Takahisa, 4,984,094, Cl. 358-335.000.

Taub, Alan I.; and Miller, Mark L., to General Electric Company. Contraction pre-annealing superconducting wire for length stabilization followed by reaction annealing. 4,983,228, Cl. 148-133.000.

Taureg, Herbert; and Klein, Heinz, to Viscodrive GmbH. Viscous shear coupling. 4,982,808, Cl. 180-233.000.

TDK Corporation: *See—*
Satoh, Takateru; Hashizume, Kenji; Sasaki, Morimasa; and Tanaka, Kimio, 4,984,120, Cl. 360-128.000.

Teac Corporation: *See—*
Tsuyuguchi, Hiroshi; Noda, Yasushi; and Uehara, Keiji, 4,984,224, Cl. 369-013.000.

Teafatiller, William J. Ring toss game apparatus. 4,982,966, Cl. 273-338.000.

Technical Research Associates, Inc.: *See—*
Peterson, Stephen C.; Brimhall, Owen D.; McLaughlin, Thomas J.; Baker, Charles D.; and Sparks, Sam L., 4,983,189, Cl. 55-15.000.

Techno Roll Co., Ltd.: *See—*
Nishiwaki, Hiroshi, 4,982,469, Cl. 15-3.000.

Technology Innovations, Inc.: *See—*
Sutton, Fred A.; and Ratzlaff, Marc H., 4,982,521, Cl. 42-74.000.

Tecnoma: *See—*
Ballu, Patrick J. M., 4,982,898, Cl. 239-77.000.

Tecumseh Products Company: *See—*
Hudson, Eric B., 4,982,705, Cl. 123-41.650.

Teikoku Piston Ring Co., Ltd.: *See—*
Nakazawa, Ribun, 4,983,992, Cl. 346-76.0PH.

Tektronix, Inc.: *See—*
Messing, Dean S.; and Luthra, Ajay K., 4,983,037, Cl. 356-73.100.

Teleco Oilfield Services Inc.: *See—*
Zitka, Mark D.; and Wells, Gary, 4,982,801, Cl. 173-163.000.

Teledyne Industries, Inc.: *See—*
Walsh, Ronald E., Jr.; Yau, Te-Lin; and Finden, Peter T., 4,983,215, Cl. 75-616.000.

Telefonaktiebolaget L M Ericsson: *See—*
Hogberg, Bertil G., 4,984,194, Cl. 364-900.000.
Karlsson, Karl O.; Westerlund, Alf T.; and Fransson, Gunnar S., 4,983,129, Cl. 439-395.000.

Telefunken Electronic GmbH: *See—*
Rinderle, Heinz, 4,983,928, Cl. 330-254.000.
Rinderle, Heinz, 4,984,031, Cl. 357-13.000.

Temple, Robert B.: *See—*
Rossigno, Louis P.; Gaiser, Robert F.; and Temple, Robert B., 4,982,999, Cl. 303-9.630.

Tenfjord A.S.: *See—*
Hildre, Hans P., 4,982,680, Cl. 114-150.000.

Teng, Clarence W.: *See—*
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., 4,983,226, Cl. 148-33.200.

Tennant, James A., to Therm-O-Disc, Incorporated. Control circuit. 4,983,897, Cl. 318-287.000.

Tepper, Howard F.: *See—*
Parla, Anthony J.; and Tepper, Howard F., 4,982,892, Cl. 228-180.100.

Terada, Akihiro: *See—*
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,984,175, Cl. 364-513.000.

Terao, Motoyasu: *See—*
Yasuoka, Hiroshi; Murase, Norio; Terao, Motoyasu; Nishida, Tetsuya; Andoo, Keikichi; and Ojima, Masahiro, 4,984,231, Cl. 369-275.100.

Terao, Naoyoshi: *See—*
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,983,825, Cl. 250-231.160.

Terasaka, Masayuki: *See—*
Takemura, Masakazu; Honda, Hironori; and Terasaka, Masayuki, 4,983,477, Cl. 429-222.000.

Terasaki, Hiroshi: *See—*
Kurita, Hitoshi; Senda, Hiroyuki; and Terasaki, Hiroshi, 4,984,184, Cl. 364-551.010.

Terasawa, Hideo: *See—*
Kikuta, Makoto; and Terasawa, Hideo, 4,983,270, Cl. 204-299.0EC.

Terasawa, Tsuneo: *See—*
Harada, Tatsuo; Kurosaki, Toshiei; Kita, Toshiaki; and Terasawa, Tsuneo, 4,983,039, Cl. 356-328.000.

Terashima, Kunio: *See—*
Igarashi, Osamu; Shibata, Takanori; Matuoka, Yoji; Watanabe, Kazuhiro; and Terashima, Kunio, 4,983,951, Cl. 340-461.000.

Terashima, Tomohide, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,984,063, Cl. 357-72.000.

Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Method for controlling exposure amount in copying of color originals. 4,984,013, Cl. 355-38.000.

Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, to Toyota Jidosha Kabushiki Kaisha; and Fujitsu Ten Limited. Automotive constant speed cruise control system. 4,984,166, Cl. 364-426.040.

Terry, Brian K.: *See—*
Engstrom, Scott M.; Myers, Christopher A.; and Terry, Brian K., 4,984,295, Cl. 455-186.000.

Teshima, Shinichi; and Hayashi, Yuzo, to Toyo Boseki Kabushiki Kaisha. Reagent for determination of acid phosphatase. 4,983,512, Cl. 435-21.000.

Tessler, Martin M.: *See—*
Tsai, John J.; Jobe, Patrick G.; Lamb, Diane J.; Billmrs, Robert L.; and Tessler, Martin M., 4,983,748, Cl. 549-551.000.

Teubert, John A.: *See—*
Overfelt, Ruel A.; and Teubert, John A., 4,983,230, Cl. 148-300.000.

Texaco Chemical Company: *See—*
Knifton, John F.; and Su, Wei-Yang, 4,983,565, Cl. 502-242.000.

Texaco Inc.: *See—*
McMahon, Matthew A.; Suggitt, Robert M.; McKeon, Ronald J.; and Brent, Albert, 4,983,296, Cl. 210-603.000.
Prukop, Gabriel, 4,982,789, Cl. 166-272.000.
Wong, Suk-Fun; Storm, David A.; and Patel, Mahendra S., 4,983,638, Cl. 518-714.000.

Texas Instruments Incorporated: *See—*
Breuninger, Robert K., 4,983,959, Cl. 340-825.830.
Cooper, Erwin E.; Davis, Franklin L.; and Sagan, Stephen F., 4,983,837, Cl. 250-334.000.
Douglas, Monte A., 4,984,039, Cl. 357-236.000.
Hemphill, Charles T.; and Picone, Joseph W., 4,984,178, Cl. 364-513.500.
Hunter, William R.; Slawinski, Christopher; and Teng, Clarence W., 4,983,226, Cl. 148-33.200.
Manns, William G.; Norwood, David A.; Weeks, Don J.; Sheng, Chyi N.; and Wood, Anthony B., 4,984,282, Cl. 382-8.000.
Tran, Hiep V.; and Scott, David B., 4,984,196, Cl. 365-51.000.
Tran, Hiep V., 4,984,211, Cl. 365-229.000.

Th. Goldschmidt AG: *See—*
Giersberg, Joachim; and Kollmeier, Hans-Joachim, 4,983,750, Cl. 558-134.000.

Thatcher, Alan J. Vertical deflashing machine. 4,982,635, Cl. 83-149.000.

Themistocleous, Themistoclis: *See—*
Copperthwaite, Richard G.; Themistocleous, Themistoclis; and Hutchings, Graham J., 4,983,560, Cl. 502-85.000.

Theobald, Hans: *See—*
Rheinheimer, Joachim; Eicken, Karl; Theobald, Hans; Kuekenhoehner, Thomas; Westphalen, Karl-Otto; Wuerzer, Bruno; Frank, Juergen; and Meyer, Norbert, 4,983,210, Cl. 71-94.000.

TheraTech Inc.: *See—*
Chang, Yunik; Patel, Dinesh C.; and Ebert, Charles D., 4,983,395, Cl. 424-448.000.

Therkelsen, Ingrid, legal representative: *See—*
Ingemann, Ole, deceased, 4,982,555, Cl. 53-405.000.

Therm-O-Disc, Incorporated: *See—*
Tennant, James A., 4,983,897, Cl. 318-287.000.

Thermaco, inc.: *See—*
Batten, William C., 4,983,284, Cl. 210-187.000.

Thermo Electron Technologies Corp.: *See—*
Korevaar, Eric J., 4,983,844, Cl. 250-382.000.

Thetford Corporation: *See—*
Cameron, David B., 4,982,456, Cl. 4-321.000.

Theurer, Josef; Hansmann, Johann, deceased (by Hansmann, Gisela, heir); Oellerer, Friedrich; and Gruber, Leopold R., to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Rail tensioning apparatus. 4,983,801, Cl. 219-54.000.

Thinking Machines Corporation: *See—*
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 4,984,235, Cl. 370-60.000.

Thoma, Christian H.: *See—*
von Kaler, Roland; and Thoma, Christian H., 4,982,566, Cl. 60-487.000.

Thomas, Dayton C.: *See—*
Maiette, Ralph L.; Starre, Stephen T.; Thomas, Dayton C.; and Crandall, Craig E., 4,983,809, Cl. 392-407.000.

Thomas, Francois R.: *See—*
Nguyen, Truong-Thao; and Thomas, Francois R., 4,983,968, Cl. 341-118.000.

Thomas, Gerard: *See—*
Vergnaud, Gerard; and Thomas, Gerard, 4,984,234, Cl. 370-58.100.

Thomas, Neil E., to Marconi Instruments Limited. Frequency counter. 4,984,254, Cl. 375-106.000.

Thompson, Chester C.; Cleland, Marshall R.; and Lopez, Edward J., to Radiation Dynamics, Inc. Apparatus and method for promoting uniform dosage of ionizing radiation in targets. 4,983,849, Cl. 250-492.300.

Thompson, Edwin: *See—*
Stiepel, Norbert M.; Thompson, Edwin; and Anderson, Luis, 4,984,089, Cl. 358-229.000.

Thompson, Ian C.: *See—*
More, Nicholas; Thompson, Ian C.; and Walton, John N., 4,982,626, Cl. 81-57.390.

Thompson, Roger L. Trim piece for suspended ceilings. 4,982,540, Cl. 52-287.000.

Thomson Composants Microondes: *See—*
Nguyen, Truong-Thao; and Thomas, Francois R., 4,983,968, Cl. 341-118.000.

Thomson-CSF: *See—*
Bourguignat, Jerome; and Migozzi, Jean-Blaise, 4,983,015, Cl. 350-96.250.
Creuzet, Gerard; and Friederich, Alain, 4,983,570, Cl. 505-001.000.

Thomson, Ian. Radon detector. 4,983,843, Cl. 250-370.020.

Thoreson, Torsten, to AB Volvo. Gear shift mechanism for tilt cab vehicles. 4,982,619, Cl. 74-473.00R.

Thorn EMI plc: *See—*
Balderson, Simon N., 4,983,810, Cl. 219-462.000.

Thorpe, James R.: *See—*
Casanova, Wayne J.; Reckinger, Arthur P., Jr.; Seyfert, Michael D.; Thorpe, James R.; and Wheeler, Stephen E., 4,984,133, Cl. 361-415.000.

Thunderbird Technologies, Inc.: *See—*
Vinal, Albert W., 4,984,043, Cl. 357-23.140.

Thuries, Edmond, to GEC Alsthom SA. High- and medium-voltage gas circuit breakers. 4,983,789, Cl. 200-148.00A.
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, to GEC Alsthom S.A. High tension circuit breaker having a dielectric blast gas. 4,983,791, Cl. 200-148.00A.
Tietz, Gary W.: *See—*
Davis, Craig M.; and Tietz, Gary W., 4,984,255, Cl. 375-106.000.
Tilky, Peter: *See—*
Balint, Tibor; Drozda, Tamas; Mozes, Gyula; Kristof, Mihaly; Hanel, Eva; and Tilky, Peter, 4,983,302, Cl. 210-638.000.
Ting, Chung-Yu: *See—*
Lu, Nicky C.; Machesney, Brian J.; Mohler, Rick L.; Miles, Glen L.; Ting, Chung-Yu; and Warley, Stephen D., 4,983,544, Cl. 437-200.000.
Tisma Machine Corporation: *See—*
Tisma, Steven, 4,982,556, Cl. 53-506.000.
Tisma, Steven, to Tisma Machine Corporation. Modularly constructed automatic packaging machine. 4,982,556, Cl. 53-506.000.
Titan Linkabit Corporation: *See—*
Moerder, Karl E., 4,984,186, Cl. 364-721.000.
TOA Medical Electronics Co., Ltd.: *See—*
Tomioka, Atsuo; Harada, Hiroyuki; and Inami, Keiichi, 4,983,359, Cl. 422-81.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Hino, Takashi; Kurodo, Hiroyuki; and Hirokawa, Kaoru, 4,983,457, Cl. 428-367.000.
Toba, Hiroto: *See—*
Ikegaya, Kazutoshi; Sannomiya, Kunio; Tsuda, Yukifumi; Maruyama, Yuji; Araki, Nobuhiro; and Toba, Hiroto, 4,983,827, Cl. 250-235.000.
Tobias, Samuel; Treene, William E.; and Williams, George E., to Hayward Industries, Inc. Flow enhancing jet fitting. 4,982,460, Cl. 4-542.000.
Tobita, Hideyuki: *See—*
Takahashi, Toshihiro; Ito, Koichi; and Tobita, Hideyuki, 4,982,468, Cl. 8-159.000.
Tobita, Yoichi: *See—*
Komatsu, Takahiro; Yamasaki, Hiroyuki; Dosaka, Katsumi; and Tobita, Yoichi, 4,984,206, Cl. 365-208.000.
Tobita, Youichi: *See—*
Kumanoya, Masaki; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Tobita, Youichi, 4,984,210, Cl. 365-222.000.
Toda, Haruki; Ohshima, Shigeo; and Ikawa, Tatsuo, to Kabushiki Kaisha Toshiba. Operation mode setting circuit for dram. 4,984,216, Cl. 365-230.080.
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, to Ono Pharmaceutical Co., Ltd. Novel prolinal derivatives. 4,983,624, Cl. 514-423.000.
Toda, Yuji: *See—*
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; Sano, Tsutomu; Nakazato, Masao; Tanaka, Masakatsu; Masuda, Katutaro; Saito, Mitsuo; and Toda, Yuji, 4,982,815, Cl. 187-105.000.
Toide, Eiichi: *See—*
Shikama, Shinsuke; and Toide, Eiichi, 4,983,002, Cl. 350-3.600.
Tokin Corporation: *See—*
Sato, Shoichi, 4,983,029, Cl. 351-41.000.
Toko Yakuhin Kogyo Kabushiki Kaisha: *See—*
Kamishita, Takuzo; Miyazaki, Takashi; and Okuno, Yoshihide, 4,983,386, Cl. 424-78.000.
Tokuda, Kazuhiro: *See—*
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,084, Cl. 398-209.000.
Sasaki, Hidemi; Nakayama, Yoshiaki; Inana, Katsuya; Kokubun, Kozo; Tokuda, Kazuhiro; and Utsugi, Mikio, 4,984,090, Cl. 358-229.000.
Tokunaga, Masaaki: *See—*
Endoh, Minoru; Nozawa, Yasuto; Iwasaki, Katsunori; Tanigawa, Shigeho; and Tokunaga, Masaaki, 4,983,232, Cl. 148-302.000.
Tokuyama Soda Kabushiki Kaisha: *See—*
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, 4,983,747, Cl. 549-423.000.
Tsugita, Takashi; Takeuchi, Shinya; Doi, Koichi; and Kishimoto, Fumito, 4,983,304, Cl. 210-640.000.
Tokyo Automatic Machinery Works, Ltd.: *See—*
Nagahashi, Toshio; Yamashita, Kiyoshi; and Sato, Minoru, 4,983,154, Cl. 493-315.000.
Tokyo Electric Co., Ltd.: *See—*
Akiyama, Sigemi; and Ishii, Hidekazu, 4,983,057, Cl. 400-216.200.
Uchimura, Mitsuo; Koike, Seiji; Koizumi, Osamu; Tashiro, Takeshi; Fushimi, Kazuhiro; and Sugiura, Ikuzo, 4,982,946, Cl. 271-251.000.
Tokyo Electron Limited: *See—*
Moriyama, Masashi, 4,982,694, Cl. 118-697.000.
Takamine, Jun, 4,983,842, Cl. 250-358.100.
Tokyo Ohka Kogyo Co., Ltd.: *See—*
Nakayama, Toshimasa; Kohara, Hidekatsu; Aoyanagi, Naoki; and Hayashi, Daisuke, 4,983,020, Cl. 350-317.000.
Tokyo University of Agriculture and Technology: *See—*
Kobayashi, Shunsuke; Ikeno, Hidenori; Maeda, Hiroki; Zhang, Bai Y.; and Yoshida, Masaaki, 4,984,198, Cl. 365-108.000.
Tolliver, Howard R.: *See—*
Bailey, Terry R.; Tolliver, Howard R.; Degler, Douglas C.; and Chirhart, Dennis J., 4,983,436, Cl. 428-40.000.
Tom, Glenn M.; and Brown, Duncan W., to Advanced Technology Materials, Inc. Apparatus for purifying arsine, phosphine, ammonia, and inert gases to remove Lewis acid and oxidant impurities therefrom. 4,983,363, Cl. 422-180.000.
Tomashot, Steven W.: *See—*
Hiltebeitel, Nathan R.; Tamlyn, Robert; and Tomashot, Steven W., 4,984,214, Cl. 365-230.050.
Tomikawa, Munehiro: *See—*
Miyaji, Hideki; Hokukoku, Shusaburo; Tomikawa, Munehiro; Hirota, Sadao; and Kikuchi, Hiroshi, 4,983,725, Cl. 536-4.100.
Tomino, Toshihiro: *See—*
Yamamoto, Masanari; Iwase, Mikio; and Tomino, Toshihiro, 4,982,622, Cl. 74-866.000.
Tomioka, Atsuo; Harada, Hiroyuki; and Inami, Keiichi, to TOA Medical Electronics Co., Ltd. Apparatus for measuring lymphocyte subclasses. 4,983,359, Cl. 422-81.000.
Tomko, Richard F.: *See—*
Rao, Madhukar; Tomko, Richard F.; and Sayre, Daniel R., 4,983,716, Cl. 528-272.000.
Tomlinson, Ronald S., to Inter-City Products Corporation (USA). Serpentine heat exchanger. 4,982,785, Cl. 165-170.000.
Tomoda, Kazuhiro: *See—*
Kojoh, Hisashi; Yamaguchi, Naoya; Tomoda, Kazuhiro; and Mizutani, Tomoji, 4,983,337, Cl. 264-41.000.
Tomoko, Fujii: *See—*
Yukio, Fujisawa; Yasuaki, Itoh; Osamu, Nishimura; and Tomoko, Fujii, 4,983,520, Cl. 435-69.300.
Tomosada, Masahiro: *See—*
Adachi, Hideki; Tomosada, Masahiro; Suzuki, Tadashi; and Ohki, Naoyuki, 4,984,020, Cl. 355-218.000.
Tomy Company, Ltd.: *See—*
Ichimura, Takahiko, 4,982,961, Cl. 273-109.000.
Tonegawa, Nobuyuki: *See—*
Yahagi, Mitsuhisa; and Tonegawa, Nobuyuki, 4,984,274, Cl. 381-43.000.
Tonelli, Claudio; and Tortelli, Vito, to Ausimont S.r.l. Branched perfluoroalkyl halides and preparation. 4,983,780, Cl. 57-137.000.
Tonomoto, Yoshihiro, to Fujitsu Limited. Cleaning unit for cleaning recording medium of an electrophotographic apparatus. 4,984,028, Cl. 355-297.000.
Tonon, Giancarlo: *See—*
Giani, Roberto P.; Parini, Ettore; and Tonon, Giancarlo, 4,983,620, Cl. 514-395.000.
Top, Siden: *See—*
Jaouen, Gerard; Vessieres, Anne; and Top, Siden, 4,983,646, Cl. 552-630.000.
Toray Industries, Inc.: *See—*
Ohgushi, Katsunori; Hijiri, Masao; and Kitazawa, Zenwemon, 4,983,814, Cl. 219-545.000.
Torazzina, Aldo, to SGS-Thomson Microelectronics Srl. Integrated audio amplifier with combined regulation of the "mute" and "standby" functions and the switching transients. 4,983,927, Cl. 330-51.000.
Torii, Hiroshi; Oishi, Minoru; Ban, Tomohiro; Furukawa, Akihiro; Furushima, Tokihito; and Nakagawa, Kazuko, to Brother Kogyo Kabushiki Kaisha. Word processor with a margin text edit function. 4,984,162, Cl. 364-518.000.
Torii, Nobutoshi: *See—*
Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,984,175, Cl. 364-513.000.
Torke, Dieter: *See—*
Kiecker, Manfred; Torke, Dieter; and Lange, Ludwig, 4,982,871, Cl. 220-426.000.
Torres Zaragoza, Vicente M., to Futura Medical S.A. Method and device for producing the whitening of live teeth with pathological and normal colorations. 4,983,381, Cl. 424-53.000.
Tortelli, Vito: *See—*
Tonelli, Claudio; and Tortelli, Vito, 4,983,780, Cl. 57-137.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ebata, Hitoshi, 4,982,693, Cl. 118-666.000.
Tosoh Corporation: *See—*
Nakagawa, Kenichi; Kitazawa, Takeshi; and Kitamura, Takashi, 4,983,023, Cl. 350-344.000.
Tsutsumi, Yoshitaka; Seita, Toru; Matsumura, Kousaburou; Nagaoka, Kyoko; and Yanagihara, Toshimitsu, 4,983,495, Cl. 430-270.000.
Toth, Hedvig. Key caddy device. 4,982,837, Cl. 206-38.100.
Toulhoat, Herve : *See—*
Born, Maurice; Parc, Guy; and Toulhoat, Herve , 4,983,558, Cl. 502-31.000.
Touma, Kiyoshi: *See—*
Matsumoto, Jun-ichi; Sasaki, Toyonori; and Touma, Kiyoshi, 4,984,003, Cl. 354-235.100.
Tower, Stephen N.; Veronesi, Luciano; and Braun, Howard E., to Westinghouse Electric Corp. Top head penetration, hydro-ball in-core instrumentation system. 4,983,351, Cl. 376-254.000.
Towers, Christine M.: *See—*
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,983,847, Cl. 250-483.100.
Toy, Malcolm D. Vehicle anti-theft device. 4,982,810, Cl. 180-287.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Shirasaki, Yoshikazu, 4,983,433, Cl. 422-36.100.
Teshima, Shinichi; and Hayashi, Yuzo, 4,983,512, Cl. 435-21.000.
Toyo Denki Seizo Kabushiki Kaisha: *See—*
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Ohtsubo, Yoshinobu, 4,984,049, Cl. 357-38.000.

Toyo Koseki Kabushiki Kaisha: *See*—
Tani, Yatsuhiro; Ohmori, Susumu; and Komagata, Hideki, 4,983,193, Cl. 55-487.000.

Toyoda Gosei Co., Ltd.: *See*—
Ohasi, Tamiyosi; Mizuno, Masami; Aoki, Tomohide; and Hokari, Osamu, 4,982,757, Cl. 137-202.000.

Toyoda, Kenichi; Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, to Fanuc Ltd. Method of directly teaching a horizontal arm type multi-articulated robot and an apparatus for carrying out same. 4,984,175, Cl. 364-513.000.

Toyoshima, Hisanori: *See*—
Koharagi, Haruo; Tahara, Kazuo; Endo, Tsunehiro; Miyashita, Kunio; Ishii, Yoshitaro; Jyoraku, Fumio; Watanabe, Syuji; Toyoshima, Hisanori; Saito, Kohichi; Hishi, Wakichiro; and Yamashita, Koujirou, 4,983,895, Cl. 318-254.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hayase, Kenji; Iguchi, Yutaka; and Tsuka, Hidemori, 4,983,826, Cl. 250-231.180.
Nakamura, Yasunari; Kuramochi, Kojiro; and Akashi, Teruo, 4,982,809, Cl. 180-248.000.
Takada, Mitsuru; Itoh, Hiroshi; Takahashi, Tokuyuki; and Funahashi, Makoto, 4,982,824, Cl. 74-869.000.
Takeda, Keiso; Kawai, Taiyo; Nakanishi, Kiyoshi; Ujihashi, Michiaki; and Takano, Yuichi, 4,982,716, Cl. 123-531.000.
Teratani, Tatsuo; Tachibana, Takeshi; Akabori, Shigetaka; Nagasaka, Masumi; Tabuchi, Hiroaki; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Takahashi, Minoru, 4,984,166, Cl. 364-426.040.

Toyota, Sumio; and Arai, Takeshi, to Yoshida Kogyo K.K. Apparatus for attaching fastener elements to a garment. 4,982,888, Cl. 227-18.000.

Tozu, Kenji: *See*—
Kuwana, Kazutaka; Yoshida, Tsuyoshi; and Tozu, Kenji, 4,984,163, Cl. 364-426.020.

Tozzolino, Pierre: *See*—
Cahiez, Gerard; Laboue, Blandine; and Tozzolino, Pierre, 4,983,774, Cl. 568-319.000.

Tracey, Stephen: *See*—
Franklin, Hunter M., 4,982,490, Cl. 29-407.000.

Trailer Design and Engineering, Inc.: *See*—
Kramer, David A., 4,982,976, Cl. 280-426.000.

Tran, Hiep V.; and Scott, David B., to Texas Instruments, Incorporated. High performance bipolar differential sense amplifier in a BiCMOS SRAM. 4,984,196, Cl. 365-51.000.

Tran, Hiep V., to Texas Instruments Incorporated. Battery backup bus scheme for an ECL BiCMOS SRAM. 4,984,211, Cl. 365-229.000.

Treene, William E.: *See*—
Tobias, Samuel; Treene, William E.; and Williams, George E., 4,982,460, Cl. 4-542.000.

Trefonas, Peter, III; Zampini, Anthony; and Madoux, David C., to Shipley Company Inc. Positive dye photoresist compositions with 2,4-bis(phenylazo)resorcinol. 4,983,492, Cl. 430-191.000.

Tri-Seal International, Inc.: *See*—
Finkelstein, Harvey, 4,982,449, Cl. 2-192.000.

Trimarchi, Adriana L. Method for lengthening normal hair. 4,982,748, Cl. 132-201.000.

Trimble, Brent J. Composite bicycle frame with pressure molded juncture. 4,982,975, Cl. 280-281.100.

Trousset, Yves: *See*—
Saint Felix, Didier; Rougee, Ann; and Trousset, Yves, 4,984,160, Cl. 364-413.190.

Trout, Barry D., to Hughes Aircraft Company. Apparatus and method for processing simultaneous radio frequency signals. 4,984,253, Cl. 375-99.000.

Troxell, James D. Method for the visual display of the migration of bowling lane oil during play. 4,982,601, Cl. 73-104.000.

Trunzo, Angelo J., to Frazier-Simplex, Inc. Batch charger for glass furnace. 4,983,206, Cl. 65-335.000.

Truong, Tuong K., to Boeing Company, The. Tightly synchronized fault tolerant clock. 4,984,241, Cl. 371-36.000.

Truskolaski, Bernard S.; and Pohl, Daniel P., to Minnesota Mining and Manufacturing Company. Ink for directly printable tape bearing release coating. 4,983,664, Cl. 524-514.000.

Trutzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,982,477, Cl. 19-0.250.

Tsai, John J.; Jobe, Patrick G.; Lamb, Diane J.; Billmrs, Robert L.; and Tessler, Martin M., to National Starch and Chemical Investment Holding Corporation. Acetals useful for the preparation of polysaccharide derivatives. 4,983,748, Cl. 549-551.000.

Tsai, Lii C., to Industrial Technology Research Institute. Organic photoreceptor for use in electrophotography employing squarylium and copper phthalocyanine as charge generation materials. 4,983,483, Cl. 430-59.000.

Tsai, Shan-chin, to Sundstrand Corporation. Torque-velocity control for variable displacement hydraulic motor. 4,983,099, Cl. 417-222.000.

Tsang, Tsze H.; Spadafora, Vincent J.; and Pomidor, Patricia, to Chevron Research and Technology Company. Fungicidal imidazole diphenylaliphaticboranes and derivatives thereof. 4,983,589, Cl. 514-64.000.

Tsang, Tsze H.; and Strutzel, Jon L., to Chevron Research and Technology Company. Fungicidal triazole bis(triphenylboranes), derivatives thereof and use thereof. 4,983,590, Cl. 514-64.000.

Tsinberg, Mikhail: *See*—
Cavallerano, Alan P.; Basile, Carlo; and Tsinberg, Mikhail, 4,984,067, Cl. 358-12.000.

Tsuchida, Eishun; Nishide, Hiroyuki; Yamamoto, Kimihisa; and Yoshida, Shu, to Idemitsu Petrochemical Co., Ltd. Process for preparing a polyarylene thioether. 4,983,720, Cl. 528-373.000.

Tsuchimoto, Shuhei: *See*—
Katayama, Satoshi; Imada, Eiji; and Tsuchimoto, Shuhei, 4,983,741, Cl. 548-324.000.

Tsuchiya, Fumio: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,984,212, Cl. 365-230.030.

Tsuda, Kenji, to Diacel Chemical Industries Ltd. Miticidal agent. 4,983,588, Cl. 514-64.000.

Tsuda, Yukifumi: *See*—
Ikegaya, Kazutoshi; Sannomiya, Kunio; Tsuda, Yukifumi; Maruyama, Yuji; Araki, Nobuhiro; and Toba, Hiroto, 4,983,827, Cl. 250-235.000.

Tsugawa, Iwao: *See*—
Utsumi, Kenichi; Koshino, Nagaaki; Goto, Yasuyuki; Tsugawa, Iwao; and Nakada, Masahiro, 4,984,232, Cl. 369-277.000.

Tsuge, Hisanao: *See*—
Gokan, Hiroshi; Mukainaru, Masahito; Suzuki, Masayoshi; Tsuge, Hisanao; and Matsuya, Hidehiko, 4,983,545, Cl. 437-228.000.

Tsugita, Takashi; Takeuchi, Shinya; Doi, Koichi; and Kishimoto, Fumito, to Tokuyama Soda Kabushiki Kaisha; and Katokichi Co., Ltd. Membrane for separation of water-alcohol mixed liquid and process for preparation thereof. 4,983,304, Cl. 210-640.000.

Tsuji, Shigeki; and Yokota, Taizo, to Sharp Kabushiki Kaisha. Optical head device for reading information stored in a recording medium. 4,983,017, Cl. 350-162.170.

Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Group supervision apparatus for elevator system. 4,982,817, Cl. 187-127.000.

Tsujii, Gen, to Honda Giken Kogyo Kabushiki Kaisha. Control method and apparatus for automatic welding machine. 4,984,171, Cl. 364-477.000.

Tsujii, Tasuhiro; Isogai, Tatsuo; Awazu, Takao; and Kimura, Tokiya, to Ishihara Sangyo Kaisha Ltd. Process for preparing a s-substituted phosphoro-chloridothiolate. 4,983,749, Cl. 558-88.000.

Tsuka, Hidemori: *See*—
Hayase, Kenji; Iguchi, Yutaka; and Tsuka, Hidemori, 4,983,826, Cl. 250-231.180.

Tsukakoshi, Osamu; Sakurada, Yuzo; and Kashimoto, Kazuhiro, to Nihon Shinku Gijutsu Kabushiki Kaisha. Ion implantation device. 4,983,850, Cl. 250-492.300.

Tsukamoto, Masahiro: *See*—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Fujimura, Itaru; Satoh, Masaharu; Fukuyama, Kensuke; Takahashi, Kenro; and Tsukamoto, Masahiro, 4,982,979, Cl. 280-707.000.

Tsukiyama, Yasumitsu: *See*—
Tatematsu, Susumu; Tsukiyama, Yasumitsu; and Hida, Junichi, 4,982,573, Cl. 62-135.000.

Tsukui, Seiichirou: *See*—
Sugano, Toshio; Tsukui, Seiichirou; and Suzuki, Shigeru, 4,984,064, Cl. 357-80.000.

Tsukui, Setsuo, to Fujitsu Limited. Passbook printing machine. 4,983,053, Cl. 400-62.000.

Tsumura, Kiyoaki: *See*—
Fujimoto, Hitoshi; and Tsumura, Kiyoaki, 4,984,056, Cl. 357-67.000.

Tsunematsu, Takao: *See*—
Miyajima, Masaharu; Yamaguchi, Yukiya; Tsunematsu, Takao; and Oda, Toshihisa, 4,983,593, Cl. 514-110.000.

Tsunoda, Shigeharu: *See*—
Yoshida, Isamu; Saeki, Junichi; Tsunoda, Shigeharu; Nishi, Kunihiko; and Mitani, Masao, 4,983,110, Cl. 425-116.000.

Tsushima, Hiroaki: *See*—
Yoshida, Masatsugu; Maruyama, Seishiro; Ezawa, Hiroshi; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,983,238, Cl. 156-86.000.

Tsutsumi, Hideo: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,983,596, Cl. 514-210.000.

Tsutsumi, Yasutsugu; Tanaka, Sueyoshi; Takahashi, Tatsuro; Morita, Yutaka; Suezaki, Hideaki; and Yamada, Hiromichi, to Mitsubishi Denki Kabushiki Kaisha. Device for resin sealing semiconductor devices. 4,983,111, Cl. 425-110.000.

Tsutsumi, Yoshitaka; Seita, Toru; Matsumura, Kousaburou; Nagaoka, Kyoko; and Yanagihara, Toshimitsu, to Tosoh Corporation. Positive resist patterns. 4,983,495, Cl. 430-270.000.

Tsuyama, Seishi: *See*—
Mitao, Shinji; Tsuyama, Seishi; and Minakawa, Kuninori, 4,983,357, Cl. 420-418.000.

Tsuyuguchi, Hiroshi; Noda, Yasushi; and Uehara, Keiji, to Teac Corporation. Apparatus for recording and/or erasing an information signal on and from a magneto-optical disk wherein the magnetic biasing field means is part of a rotor magnet included in a stepping motor. 4,984,224, Cl. 369-013.000.

Tsuzaki, Nozomi: *See*—
Tanaka, Toshiyasu; Tsuzaki, Nozomi; and Kobayashi, Toyohiro, 4,983,011, Cl. 350-96.200.

Tsuzuki, Takayoshi: *See*—
Kotaki, Mitsuko; Oda, Yukihisa; and Tsuzuki, Takayoshi, 4,983,946, Cl. 338-200.000.

Tsuzurahara, Mamoru; and Ohara, Ichiro, to Hitachi, Ltd. Through-type capacitor. 4,984,129, Cl. 361-302.000.

Tull, Thomas W., to Henkel Corporation. Cold deformation process employing improved lubrication coating. 4,983,229, Cl. 148-246.000.

Tungatt, Paul D.; Tyler, Derek E.; and Cheskis, Harvey P., to Olin Corporation. Technique for forming silicon carbide coated porous filters. 4,983,219, Cl. 106-287.130.
Turner, Anthony P. F.; Hodges, Alan P.; Franklin, Ann; Ramsay, Graham; and Steel, Davina, to Paul De La Pena Limited. Bioelectrochemical measurement of microbial activity using a working electrode of carbon-bearing porous material. 4,983,516, Cl. 435-34.000.
Turner, Larry R.: *See*—
Lari, Robert J.; Praeg, Walter F.; and Turner, Larry R., 4,982,796, Cl. 164-467.000.
Twist, Peter J.: *See*—
Marsden, Peter D.; Fyson, John R.; and Twist, Peter J., 4,983,504, Cl. 430-398.000.
Tyler, Derek E.: *See*—
Tungatt, Paul D.; Tyler, Derek E.; and Cheskis, Harvey P., 4,983,219, Cl. 106-287.130.
Tzou, Kae M. Electronically self-latching cylinder lock. 4,982,587, Cl. 70-492.000.
UAS Automation Systems, Inc.: *See*—
Maiette, Ralph L.; Starre, Stephen T.; Thomas, Dayton C.; and Crandall, Craig E., 4,983,809, Cl. 392-407.000.
Ube Industries, Ltd.: *See*—
Ueno, Kouhei; Akagawa, Tomohiko; and Nakano, Yoshifumi, 4,983,647, Cl. 523-220.000.
Uchida, Katsuyuki; and Takahata, Haruo, to Murata Manufacturing Co., Ltd. Organic positive temperature coefficient thermistor. 4,983,944, Cl. 338-22.00R.
Uchida, Tomoaki, to Victor Company of Japan, Ltd. Signal converting apparatus. 4,984,077, Cl. 358-140.000.
Uchida, Tomoaki: *See*—
Sugiyama, Kenji; Katayama, Yasuyuki; Suzuki, Nobuyuki; Uchida, Tomoaki; and Kouguchi, Tatsushi, 4,984,068, Cl. 358-31.000.
Uchimura, Mitsuo; Koike, Seiji; Koizumi, Osamu; Teshiro, Takeshi; Fushimi, Kazuhiro; and Sugiura, Ikuzo, to Tokyo Electric Co., Ltd. Apparatus for transporting paper. 4,982,946, Cl. 271-251.000.
Uchinami, Masanobu: *See*—
Takahashi, Toshihisa; Uchinami, Masanobu; Nishida, Shinichi; and Inoue, Hitoshi, 4,982,714, Cl. 123-488.000.
Uchino, Shouichi; Iwayanagi, Takao; and Hashimoto, Michiaki, to Hitachi, Ltd. Radiation imaging process for formation of contrast enhanced pattern using two photosensitive dialonium salt layers with removal of overlayer and developed resist pattern in underlayer. 4,983,500, Cl. 430-325.000.
Udagawa, Takashi: *See*—
Hiraki, Tadayoshi; Iwase, Osamu; Ogumimoto, Hirosi; Sugiura, Shinji; Tabushi, Ichiro; Kume, Masafumi; Udagawa, Takashi; Matsui, Komaharu; and Fujii, Yasuhiro, 4,983,454, Cl. 428-335.000.
Ueda, Hideaki, to Minolta Camera Kabushiki Kaisha. Photosensitive member comprising an azo compound. 4,983,480, Cl. 430-58.000.
Ueda, Tsunehisa: *See*—
Miki, Yoshiaki; Ueda, Tsunehisa; and Natsuume, Tadao, 4,983,441, Cl. 428-65.000.
Uede, Hisashi: *See*—
Fujioka, Yoshihide; Harada, Shigeyuki; Ohba, Toshihiro; Kanatani, Yoshiharu; and Uede, Hisashi, 4,983,885, Cl. 315-169.300.
Uehara, Katsuhiro; Ishii, Takahiko; Fujikawa, Takao; Kanda, Kuniaki; and Narukawa, Yutaka, to Kabushiki Kaisha Kobe Seiko Sho. Interlocking device for hot isostatic pressurizing equipment. 4,983,112, Cl. 425-136.000.
Uehara, Keiji: *See*—
Tsuyuguchi, Hiroshi; Noda, Yasushi; and Uehara, Keiji, 4,984,224, Cl. 369-013.000.
Ueki, Toru; Sentoku, Hajime; Miyazaki, Takashi; and Sugihara, Eiichi, to Mitsui Toatsu Chemicals, Inc. Adhesives. 4,983,435, Cl. 428-36.600.
Uematsu, Ryosuke, to NEC Corporation. Apparatus for liquid development of electrostatic latent images. 4,982,692, Cl. 118-661.000.
Uemura, Shunichi; and Banjo, Toshinobu, to Mitsubishi Denki Kabushiki Kaisha. Packaged semiconductor device. 4,984,062, Cl. 357-70.000.
Uemura, Toshirou: *See*—
Kano, Mitsunari; and Uemura, Toshirou, 4,984,285, Cl. 382-50.000.
Ueno, Kouhei; Akagawa, Tomohiko; and Nakano, Yoshifumi, to Ube Industries, Ltd. Reinforced polypropylene composition. 4,983,647, Cl. 523-220.000.
Ueyama, Noboru: *See*—
Inoue, Kenji; Takahashi, Satomi; Yonetsu, Keiichi; and Ueyama, Noboru, 4,983,759, Cl. 500-174.000.
Ueyama, Seiji, to General Company Limited. Thermal printing ribbon. 4,983,445, Cl. 428-212.000.
Uggetti, Sergio: *See*—
Falconieri, Remo; and Uggetti, Sergio, 4,983,056, Cl. 400-208.000.
Ujihashi, Michiaki: *See*—
Takeda, Keiso; Kawai, Taiyo; Nakanishi, Kiyoshi; Ujihashi, Michiaki; and Takano, Yuichi, 4,982,716, Cl. 123-531.000.
Ulferts, Calvin. Merry-go-round. 4,982,949, Cl. 272-33.00R.
Ullal, Pramode N.; and Kazmierczak, Frederick F. Ski and pole carrier. 4,982,883, Cl. 224-209.000.
Ullman, Myron, to Boardman Molded Products, Inc. Exercise board. 4,982,958, Cl. 272-138.000.
Ullum, Henrik. Apparatus for heating and/or drying. 4,982,514, Cl. 34-183.000.
Ulrich, Peter C.; and Cerami, Anthony, to Rockefeller University, The. Inhibitors of nonenzymatic cross-linking. 4,983,604, Cl. 514-238.500.
Ultrasystems Defense Inc.: *See*—
Flynn, Jeffrey C., 4,984,192, Cl. 364-900.000.
Umeda, Masaru: *See*—
Ohmi, Tadahiro; Shibata, Tadashi; and Umeda, Masaru, 4,984,060, Cl. 357-68.000.
Umemura, Shizuo, to Fuji Photo Film Co., Ltd. Magneto-optical thin film. 4,983,025, Cl. 350-377.000.
Umezaki, Tomokazu, to Mitsubishi Denki Kabushiki Kaisha. Method of making a high-voltage transformer. 4,982,498, Cl. 29-602.100.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, to Bristol-Myers Company. N-(4-(3-aminopropyl)aminobutyl)-2-(ω-guanidino-fatty-acid-amido(-2-substituted-ethanamide, salt thereof, and process for preparation thereof. 4,983,328, Cl. 260-404.500.
Umlauf, William P.: *See*—
Petzold, Werner P.; and Umlauf, William P., 4,982,822, Cl. 192-3.580.
Undin, Hans: *See*—
Schmode, Hartmut; Wiebe, Ulrich; and Undin, Hans, 4,982,630, Cl. 81-352.000.
Uni-Charm Corporation: *See*—
Yanagihara, Takeshi; Honda, Tsugio; Nakano, Makoto; and Kajino, Hiroshi, 4,983,450, Cl. 428-283.000.
UNICOR GmbH Rahn Plastmaschinen: *See*—
Rahn, Horst, 4,983,347, Cl. 264-508.000.
Union Carbide Chemicals and Plastic Company Inc.: *See*—
Doumaux, Arthur R., Jr.; and Schreck, David J., 4,983,736, Cl. 544-402.000.
Union Carbide Chemicals and Plastics Company Inc.: *See*—
Green, Gregory R.; and Green, George R., 4,983,222, Cl. 134-22.100.
Schramm, Kathleen D.; and Karol, Frederick J., 4,983,562, Cl. 502-112.000.
Union Carbide Coatings Service Technology Corporation: *See*—
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Unozawa, Atsuo. Rotary cutting tool. 4,983,078, Cl. 407-34.000.
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Van Den Brandt, Adrianus H. J., to U.S. Philips Corporation. Projection system. 4,983,032, Cl. 353-30.000.
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Van Linden, Jan H. L.; Kionosz, Michael J.; and Bowser, James R., to Aluminum Company of America. Aluminum scrap melting. 4,983,216, Cl. 75-672.000.
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Van Sickle, Dale E., to Eastman Kodak Company. Diisopropylbiphenyl mono- and di-hydroperoxides, process for the preparation thereof, and compounds derived therefrom. 4,983,777, Cl. 568-568.000.
Van Tulleken, Anthony; and Johnson, David, to Interpet Ltd. Submersible aquarium heater with adjustable electronic thermostatic control. 4,983,813, Cl. 219-523.000.
Vara, Fulvio J.; and Dougherty, James A., to GAF Chemicals Corporation. Vapor phase hardening of curable organic compounds. 4,983,425, Cl. 427-340.000.
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Verhoeven, Peter, to OMI International Corporation. Conversion composition and process. 4,983,262, Cl. 204-38.400.
Vermesse, Bernard, to SMH Alcatel. Limited write non-volatile memory and a franking machine making use thereof. 4,984,191, Cl. 364-900.000.
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Verrando, Marcel G.; White, Donald H.; Koslow, Evan E.; and Barkley, Phillip G., to Pall Corporation. Pressure-swing adsorption system and method for NBC collective protection. 4,983,190, Cl. 55-21.000.

Vessieres, Anne: *See*—
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Vidal, Henri; and Muelas-Medrano, Santiago, to Vidal, Henri. Joining of a concrete element to a support. 4,982,550, Cl. 52-747.000.
Vidal, Henri. Facings for earthworks. 4,983,076, Cl. 405-284.000.
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Vives, Jordi B.; and Hernandez, Jaime U., to Mecanismos Auxiliares Industriales, S.A. Wire harness taping arrangement and taping machine therefor. 4,982,560, Cl. 57-10.000.
Vlasbloem, Hugo; and Duinker, Simon, to B.V. Optische Industries "De Oude Delft". Apparatus for slit radiography comprising discrete, controllable attenuation elements coacting with a slit diaphragm. 4,984,258, Cl. 378-145.000.
Voest-Alpine Maschinenbau Gesellschaft mbH: *See*—
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von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest. Textile sheet filter. 4,983,192, Cl. 55-387.000.
von Buren, Stefan; and Paulovic, Anton S., to Husky Injection Molding Systems Ltd. Anti-drool injection molding apparatus. 4,983,117, Cl. 425-563.000.
von Holdt, John W. Container connector system. 4,982,858, Cl. 250-23.400.
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Vorbruggen, Helmut; Schwarz, Norbert; Loge, Olaf; Sturzebecher, Claus-Steffen; and Elger, Walter, to Schering Aktiengesellschaft. 11-haloprostane derivatives, processes for their preparation and their use as medicinal agents. 4,983,629, Cl. 514-530.000.
Vottero-Fin, Alberto; and Prato, Luigi, to Fiat Auto S.p.A. Automotive seating system featuring a television set. 4,982,996, Cl. 297-194.000.
Vu, Thuan D.; and Spector, George. Clip on flat sun visor. 4,982,992, Cl. 296-97.600.
Vyskumny ustav chemickej technologie vyskumna a vyvojova organizacia: *See*—
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Wada, Mikuni. Medical attendance bathtub bed. 4,982,462, Cl. 4-546.000.
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Wada, Yutaka; Kobayashi, Yasuhiro; and Mitsuta, Toru, to Hitachi, Ltd. Method for computer aided generator of design reference and apparatus therefor. 4,984,180, Cl. 364-518.000.
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Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, 4,983,700, Cl. 528-34.000.
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Waldern, Jonathan D., to W. Industries Limited. Method and apparatus for the perception of computer-generated imagery. 4,984,179, Cl. 364-514.000.
Walker, John G. Wingsail flap torque equalization. 4,982,679, Cl. 114-102.000.
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Wang, Hsug-Fang. Extinguisher for use in an automobile. 4,982,798, Cl. 169-62.000.
Wang, Shui-Mu. Simulated climbing exercise device. 4,982,952, Cl. 272-70.000.
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Wanner, Hans, to Fritz Haug, AG. Device for adjustable mounting of guide rails on a base. 4,982,923, Cl. 248-286.000.
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Ward, Terence J.; White, Janet C.; and Bradley, Gerald, to John Wyeth & Brother Limited. Heterocyclic compounds useful as 5-HT_3 antagonists. 4,983,600, Cl. 514-214.000.
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Warm, Aleksander; and McGarrity, John, to Lonza Ltd. Substituted thienylethylamines and process for their production. 4,983,744, Cl. 549-75.000.
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Yamano, Yasuteru: *See*—
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Yamasaki, Hiroyuki: *See*—
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Yamashita, Sachihiro: *See*—
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Yamazaki, Isao: *See*—
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Yamazaki, Katsumi: *See*—
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Yamazaki, Shiro: *See*—
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Yoshida, Masashi; Suzuki, Katsuhisa; and Yoshikawa, Masaaki, to Nikkiso Co. Ltd. Semipermeable membrane and process for preparing same. 4,983,293, Cl. 210-500.230.
Yoshida, Masatsugu; Maruyama, Seishiro; Ezawa, Hiroshi; Watanabe, Takayuki; and Tsushima, Hiroaki, to Mitsui Toatsu Chemicals, Inc. Method for manufacturing a thermoplastic container with a label. 4,983,238, Cl. 156-86.000.
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Yoshida, Shigekazu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having directly connected source terminal. 4,984,051, Cl. 357-42.000.
Yoshida, Shu: *See*—
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Yoshida, Tatsuya, to Asahi Kogaku Kogyo Kabushiki Kaisha. Toner cartridge. 4,984,023, Cl. 355-260.000.
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Yoshida, Tomoe: *See*—
Shukunobe, Yukitaka; Nakamura, Tetsuo; Aono, Koji; Doki, Ryoichi; Kuwazuru, Mamoru; Shimoda, Kouzou; and Yoshida, Tomoe, 4,983,361, Cl. 422-145.000.
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Yoshikawa, Akira; and Takeuchi, Tsunezo, to NGK Insulators, Ltd. Clamp device for shaped bodies. 4,982,939, Cl. 269-32.000.
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Yoshida, Masashi; Suzuki, Katsuhisa; and Yoshikawa, Masaaki, 4,983,293, Cl. 210-500.230.
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Yoshimaru, Tomohisa, to Kabushiki Kaisha Toshiba. Optical disc device. 4,984,227, Cl. 369-32.000.
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Yoshimura, Susumu: *See*—
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Yoshino, Toshihiko; Funatsu, Koichi; and Ishikawa, Keiichi, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling the automatic transmission of a vehicle. 4,982,623, Cl. 74-866.000.
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Yu, Robert C. U., to Xerox Corporation. Electrostatographic imaging system. 4,983,481, Cl. 430-59.000.
Yu, Simon H. Process for making macromolecular monomers of polylactones with terminal acryloyl unsaturation and block copolymers thereof. 4,983,689, Cl. 525-412.000.
Yudin, Cal, to North American Oil Company, Inc. Quick car-cooling composition. 4,983,314, Cl. 252-71.000.
Yuge, Shizuo: *See*—
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Yukimoto, Sadao; Hirose, Toshifumi; Wakabayashi, Hiroshi; and Isayama, Katsuhiko, to Kanegafuchi Chemical Industry, Co. Ltd. Curable polymer composition. 4,983,700, Cl. 528-34.000.
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Zajeski, Robert B.; and Wiencek, Donald C. Vertical printer stand. 4,982,927, Cl. 248-674.000.

Zambon Group S.p.A.: *See*—
Casagrande, Cesare; and Santangelo, Francesco, 4,983,606, Cl. 514-248.000.
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Zazzara, Karen L.: *See*—
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Zeria Pharmaceutical Co: *See*—
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Zhu, Yong H.: *See*—
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Zia Technology, Inc.: *See*—
Bottinelli, N. Edward; Kotraba, Norman L.; and Bishop, Norman G., 4,983,214, Cl. 75-387.000.
Ziecker, Roger A.: *See*—
Miller, Scott R.; Raterman, John M.; and Ziecker, Roger A., 4,983,109, Cl. 425-7.000.
Zieles, Robert S.: *See*—
Brown, Reed S.; Brzezinski, Alex M.; Jue, Tinyee; Woods, William L., Jr.; and Zieles, Robert S., 4,984,268, Cl. 379-433.000.
Zigan, Bernhard: *See*—
Holsiepe, Dietmar; Lohnherr, Ludger; Grudno, Hans-Dieter; and Zigan, Bernhard, 4,982,905, Cl. 241-79.100.
Zimmerman, Charles E.: *See*—
Strong, Michael D.; Zimmerman, Charles E.; and Kiapokas, Michael G., 4,982,830, Cl. 198-349.600.
Zimpro/Passavant Inc.: *See*—
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Zitka, Mark D.; and Wells, Gary, to Teleco Oilfield Services Inc. Flexible coupling for downhole motor. 4,982,801, Cl. 173-163.000.
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Wilmott, James M.; and Znaiden, Alexander P., 4,983,382, Cl. 424-62.000.
Zollfrank nee Baumann, Gerlinde: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,983,207, Cl. 71-88.000.
Zollner, Manfred, to Grote & Hartmann GmbH & Co. KG. Process and device for machine application of sealing glands to electric lines. 4,983,236, Cl. 156-52.000.
Zorn, David K.: *See*—
Zorn, David R.; and Zorn, David K., 4,982,670, Cl. 104-93.000.
Zorn, David R.; and Zorn, David K. Covered hanger conveyance rail system. 4,982,670, Cl. 104-93.000.
Zucker, Joseph: *See*—
Campbell, Bruce D.; and Zucker, Joseph, 4,983,008, Cl. 350-96.160.
Zupancic, Denise M.: *See*—
Lupton, F. S.; and Zupancic, Denise M., 4,983,299, Cl. 210-617.000.
Zwarun, Andrew: *See*—
Hunsinger, Peter; and Zwarun, Andrew, 4,983,416, Cl. 427-2.000.
Zweig, Leon A. Method of infusing catalytic cross-linking agents into lithographic printing ink. 4,982,661, Cl. 101-451.000.
810296 Ontario Inc.: *See*—
Moore, Robert A., 4,982,572, Cl. 62-122.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JANUARY, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Assembly Tools, Inc.: *See*—
Ciolli, Donald A., Re. 33,514, Cl. 192-48.920.

Ciolli, Donald A., to American Assembly Tools, Inc. Adjustable torque limiting assembly. Re. 33,514, Cl. 192-48.920.

Fershko, Jane S.; and Lackey, Robert W., to Mead Corporation, The. Gravity feed display device. Re. 33,515, Cl. 211-49.100.

Jurdi, Wissam J.: *See*—
Shibata, Tomoo; and Jurdi, Wissam J., Re. 33,517, Cl. 503-200.000.

Lackey, Robert W.: *See*—
Fershko, Jane S.; and Lackey, Robert W., Re. 33,515, Cl. 211-49.100.

Mead Corporation, The: *See*—
Fershko, Jane S.; and Lackey, Robert W., Re. 33,515, Cl. 211-49.100.

Ricoh Electronics, Inc.: *See*—
Shibata, Tomoo; and Jurdi, Wissam J., Re. 33,517, Cl. 503-200.000.

Shibata, Tomoo; and Jurdi, Wissam J., to Ricoh Electronics, Inc. Thermosensitive recording label. Re. 33,517, Cl. 503-200.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Airpax Corp.: *See*—
Merchant, Donald K., B1 4,510,479, Cl. 337-91.000.

Hitachi, Ltd.: *See*—
Kimura, Tomoaki; and Miyakozawa, Keiji, B1 4,491,005, Cl. 72-201.000.

Jurgens, George W.: *See*—
Shjeflo, Jelmer B., B1 4,062,141, Cl. 43-3.000.

Jurgens, Margaret M.: *See*—
Shjeflo, Jelmer B., B1 4,062,141, Cl. 43-3.000.

Kimura, Tomoaki; and Miyakozawa, Keiji, to Hitachi, Ltd. Rolling mill. B1 4,491,005, 1-8-91, Cl. 72-201.000.

Merchant, Donald K., to Airpax Corp. PC-board mounted thermal breaker. B1 4,510,479, 1-8-91, Cl. 337-91.000.

Miyakozawa, Keiji: *See*—
Kimura, Tomoaki; and Miyakozawa, Keiji, B1 4,491,005, Cl. 72-201.000.

Shjeflo, Jelmer B., to Jurgens, Margaret M.; and Jurgens, George W. Decoy. B1 4,062,141, 1-8-91, Cl. 43-3.000.

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Abbott Laboratories: *See*—
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Abrams, Robert C.: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 313,573, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 313,574, Cl. D11-164.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 313,575, Cl. D11-164.000.

Adams Mfg.: *See*—
Adams, William E., 313,660, Cl. D26-9.000.

Adams, William E., to Adams Mfg. Candle anchor. 313,660, 1-8-91, Cl. D26-9.000.

Agrimont S.p.A.: *See*—
Caprioli, Vincenzo, 313,641, Cl. D22-119.000.

Alfa-Laval Agri Scandinavia AB: *See*—
Johansson, Henry; Eriksson, Tord; and Berglund, Arne, 313,685, Cl. D34-29.000.

Allard, Peter B.; Howland, Leland L.; Parker, Jan H.; and Ziegler, David B., to Thermo King Corporation. Cover for a remote indicator light. 313,569, 1-8-91, Cl. D10-114.000.

Amozorrutia, Delia: *See*—
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Amozorrutia, Fernando U.; and Amozorrutia, Delia. Cap. 313,497, 1-8-91, Cl. D2-244.000.

Anderson, Bruce O.: *See*—
Bush, Paul; and Anderson, Bruce O., 313,518, Cl. D6-428.000.

Anderson, Joel M.; and Hollenkemp, Gregory G., to Ashland Oil, Inc. Barrel sign. 313,630, 1-8-91, Cl. D20-10.000.

Appenzeller, Rudolf M. Desk top novelty. 313,572, 1-8-91, Cl. D11-160.000.

Arone, Cathleen; and Johnson, Louise. Sea babies doll. 313,636, 1-8-91, Cl. D21-171.000.

Ashland Oil, Inc.: *See*—
Anderson, Joel M.; and Hollenkemp, Gregory G., 313,630, Cl. D20-10.000.

Aveni, Michael A., to Nike, Inc.; and Nike International, Ltd. Shoe upper. 313,498, 1-8-91, Cl. D2-314.000.

Azuelos, Pierre-Yves, to PYM, Inc. Case for a radio or the like. 313,508, 1-8-91, Cl. D3-30.100.

Baldwin Hardware Corporation: *See*—
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Barnes, Helen T. Animal grooming equipment organizer. 313,524, 1-8-91, Cl. D6-553.000.

Barrault, Jean-Louis, to MOULINEX, Societey Anonyme. Deep fryer. 313,531, 1-8-91, Cl. D7-360.000.

Barron, John M.; Horan, Robert T.; Hoftman, Moshe M.; Noack, William L.; and Sandel, Dan, to Devon Industries, Inc. Disposable handle for a hospital surgery room light fixture or the like. 313,670, 1-8-91, Cl. D26-113.000.

Barry, Timothy C.: *See*—
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Bausch & Lomb Incorporated: *See*—
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Berglund, Arne: *See*—
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Bergstrand, John W.: *See*—
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Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 313,574, Cl. D11-164.000.

Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 313,575, Cl. D11-164.000.
Bingham, John R. Towel holder. 313,522, 1-8-91, Cl. D6-547.000.
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Block, Mitchell L., 313,520, Cl. D6-467.000.
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Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 313,574, Cl. D11-164.000.
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Buckles, Joseph M. Wall mounted strap for holding tools or similar articles. 313,547, 1-8-91, Cl. D8-373.000.
Burenga, Thomas I., to Worksaver, Inc. Adjustable offset disc harrow frame. 313,603, 1-8-91, Cl. D15-11.000.
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Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Executive desk. 313,518, 1-8-91, Cl. D6-428.000.
Caires, Richard. Flashlight for handbags or similar article. 313,662, 1-8-91, Cl. D26-37.000.
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Tokuda, Hiroyuki, 313,616, Cl. D18-36.000.
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29	4,982,598
35	4,982,599
104	4,982,600
	4,982,601
118.2	4,982,602
150 R	4,982,603
153	4,982,604
204.19	4,982,605
304 C	4,982,606
725	4,982,607
756	4,982,608
849	4,982,609
861.62	4,982,610
862.04	4,982,611
862.23	4,982,612
862.64	4,982,613
863.81	4,982,614
864.51	4,982,615
864.81	4,982,616

CLASS 74

333	4,982,617
471 XY	4,982,618
473 R	4,982,619
731.1	4,982,620
866	4,982,621
	4,982,622
	4,982,623
869	4,982,624

CLASS 75

238	4,983,212
252	4,983,213
387	4,983,214
616	4,983,215
672	4,983,216
739	4,983,217

CLASS 81

53.2	4,982,625
57.39	4,982,626
121.1	4,982,627
125	4,982,628
176.1	4,982,629
352	4,982,630
426	4,982,631
438	4,982,632

CLASS 82

123	4,982,633
129	4,982,634

CLASS 83

39	4,983,081
149	4,982,635
167	4,982,636
346	4,982,637
614	4,982,638
659	4,982,639

CLASS 84

293	4,982,640
329	4,982,641
484	4,982,642
613	4,982,643
627	4,982,644

CLASS 89

1.11	4,982,645
1.35	4,982,646
8	4,982,647
14.1	4,982,648
28.05	4,982,649
34	4,982,650

CLASS 91

499	4,982,651

CLASS 92

5 R	4,982,652

CLASS 98

39.1	4,982,653

CLASS 99

323.3	4,982,654
337	4,982,655
403	4,982,656
421 A	4,982,657

CLASS 100

007	4,982,658

CLASS 101

287	4,982,659
350	4,982,660
451	4,982,661

CLASS 102

205	4,982,662
251	4,982,663
272	4,982,664
306	4,982,665
439	4,982,666
476	4,982,667
495	4,982,668
520	4,982,669

CLASS 104

93	4,982,670

CLASS 105

168	4,982,671

CLASS 106

287.13	4,983,219
600	4,983,218
692	4,983,220

CLASS 108

51.1	4,982,859

CLASS 110

346	4,982,672

CLASS 112

112	4,982,673
121.12	4,982,674
	4,982,675
121.15	4,982,676
314	4,982,677

CLASS 114

74 R	4,982,678
102	4,982,679
150	4,982,680
264	4,982,681
270	4,982,682

CLASS 116

63 P	4,982,683
203	4,982,684
237	4,982,685

CLASS 118

406	4,982,686
410	4,982,687
420	4,982,688
656	4,982,689
657	4,982,690
658	4,982,691
661	4,982,692
666	4,982,693
697	4,982,694
723	4,982,696
729	4,982,695

CLASS 119

3	4,982,697
54	4,982,698
72.5	4,982,699
96	4,982,700
121	4,982,701
158	4,982,702

CLASS 122

6 A	4,982,703

CLASS 123

41.1	4,982,704
41.65	4,982,705
90.12	4,982,706
192 B	4,982,707
297	4,982,708
339	4,982,709
399	4,982,710
	4,982,711
424	4,982,712
467	4,982,713
488	4,982,714
518	4,982,715
531	4,982,716
603	4,982,717

CLASS 124

35.2	4,982,718
89	4,982,719

CLASS 125

15	4,982,720

CLASS 126

116 A	4,982,721
400	4,982,722
440	4,982,723

CLASS 128

4	4,982,724
	4,982,725
	4,982,726
	4,982,727
11	4,982,729
24 A	4,982,730
79	4,982,731
80 C	4,982,732
200.14	4,982,734
204.23	4,982,735
400	4,982,736
581	4,982,737
670	4,982,738
750	4,982,739
760	4,982,740
771	4,982,741
798	4,982,742
800	4,982,743
804	4,982,733
877	4,982,744
	4,982,745

CLASS 131

235.1	4,982,746

CLASS 132

75.5	4,982,747
201	4,982,748
204	4,982,749
	4,982,750
299	4,982,751
327	4,982,752

CLASS 134

6	4,983,221
22.1	4,983,222
25.4	4,983,223
40	4,983,224
95	4,982,753
167 R	4,982,754

CLASS 136

201	4,983,225

CLASS 137

3	4,982,755
4	4,982,756
202	4,982,757
505.42	4,982,758
527.8	4,982,759
559	4,982,760
614.03	4,982,761
614.17	4,982,762

CLASS 138

89	4,982,763
	4,982,764
122	4,982,765

CLASS 139

383 A	4,982,766
449	4,982,767

CLASS 141

6	4,982,768
98	4,982,769
258	4,982,770
312	4,982,771

CLASS 144

357	4,982,772

CLASS 148

33.2	4,983,226
128	4,983,227
133	4,983,228
246	4,983,229
300	4,983,230
301	4,983,231
302	4,983,232
428	4,983,233

CLASS 149

29	4,983,234
109.6	4,983,235

CLASS 152

209 B	4,982,773
	4,982,775
209 R	4,982,774

CLASS 156

52	4,983,236
83	4,983,237
86	4,983,238
123	4,983,239
148	4,983,240
157	4,983,241
172	4,983,242
192	4,983,243
224	4,983,244
231	4,983,245
240	4,983,246
272.2	4,983,247
487	4,983,248
603	4,983,249
628	4,983,250
630	4,983,251
	4,983,252
643	4,983,253
	4,983,254
	4,983,255

CLASS 160

178.2	4,982,776

CLASS 162

18	4,983,256
158	4,983,257
189	4,983,258

CLASS 164

63	4,982,777
130	4,982,778
152	4,982,779
463	4,982,780
467	4,982,796
526	4,982,781

CLASS 165

1	4,982,782
80.1	4,982,783
109.1	4,982,784
170	4,982,785

CLASS 166

50	4,982,786
82	4,982,787
266	4,982,788
272	4,982,789
299	4,982,790
	4,982,791
	4,982,792
305.1	4,982,793
357	4,982,794
382	4,982,795

CLASS 168

4	4,982,797

CLASS 169

62	4,982,798

CLASS 172

2	4,982,799
19	4,982,800

CLASS 173

163	4,982,801

CLASS 174

53	4,983,785
65 SS	4,983,784

CLASS 175

57	4,982,802

CLASS 178

18	4,983,786
	4,983,787

CLASS 180

132	4,982,803
140	4,982,804
179	4,982,805
197	4,982,806
	4,982,807
233	4,982,808
248	4,982,809
287	4,982,810

CLASS 181

106	4,982,811
202	4,982,812

CLASS 182

138	4,982,813
230	4,982,814

CLASS 187

105	4,982,815
119	4,982,816
127	4,982,817

CLASS 188

73.1	4,982,818
296	4,982,819

CLASS 190

16	4,982,820

CLASS 192

3.29	4,982,821
3.58	4,982,822
38	4,982,823
48.92	Re.33,514
85 AB	4,982,824
90	4,982,825
106 F	4,982,826

CLASS 196

106	4,983,259

CLASS 198

337	4,982,829
341	4,982,827
349.6	4,982,830
365	4,982,828
617	4,982,831
735.3	4,982,832
778	4,982,833
803.7	4,982,834
836.3	4,982,835
838	4,982,836

CLASS 200

16 R	4,983,788
30 R	4,983,790
144 B	4,983,793
148 A	4,983,789
	4,983,791
148 F	4,983,792
461	4,983,794
550	4,983,795

CLASS 203

14	4,983,260

CLASS 204

30	4,983,261
38.4	4,983,262
44.2	4,983,263
98	4,983,264
181.7	4,983,266
182.4	4,983,267
182.8	4,983,268
192.13	4,983,269
269	4,983,265
299 EC	4,983,270
426	4,983,271

CLASS 206

38.1	4,982,837
209	4,982,838
215	4,982,839
223	4,982,840
316.2	4,982,841
365	4,982,842
366	4,982,843
506	4,982,844
621	4,982,845
621.3	4,982,846

CLASS 208

50	4,983,272
89	4,983,273
111	4,983,274
	4,983,275
120	4,983,276
252	4,983,277
407	4,983,278
413	4,983,279

CLASS 209

241	4,983,280
418	4,983,281

CLASS 210

95	4,983,282
104	4,983,283
187	4,983,284
197	4,983,285
257.1	4,983,286
259	4,983,287
321.87	4,983,288
360.1	4,983,289
413	4,983,290
490	4,983,291
491	4,983,292
500.23	4,983,293
521	4,983,294
	4,983,295
603	4,983,296
605	4,983,297
613	4,983,298
617	4,983,299
634	4,983,300
636	4,983,301
638	4,983,302
640	4,983,303
	4,983,304
642	4,983,305
724	4,983,306
748	4,983,307
794	4,983,308

CLASS 211

41	4,982,847
49.1	Re.33,515
55	4,982,848
59.2	4,982,849
74	4,982,850
151	4,982,851
162	4,982,852

CLASS 212

231	4,982,853

CLASS 215

1 A	4,982,854
235	4,982,855

CLASS 219

10.493	4,983,799
10.55 M	4,983,798
54	4,983,801
69.12	4,983,802
69.16	4,983,800
69.17	4,983,803
85.11	4,983,804
101	4,983,805
121.15	4,983,806
121.48	4,983,807
121.63	4,983,796
121.64	4,983,797
	4,983,808
451	4,983,812
462	4,983,810
497	4,983,811
523	4,983,813
545	4,983,814

CLASS 220

3	4,982,856
8	4,982,857
89.1	4,982,861
278	4,982,862
318	4,982,863
320	4,982,864
324	4,982,865
335	4,982,866
403	4,982,867
404	4,982,868
	4,982,869
414	4,982,870
426	4,982,871
461	4,982,872
606	4,982,860

CLASS 222

77	4,982,873
78	4,982,874
83	4,982,875
153	4,982,876
321	4,982,877
327	4,982,878
400.7	4,982,879
490	4,982,880
514	4,982,881
531	4,982,882

CLASS 224

209	4,982,883
211	4,982,884
253	4,982,885
321	4,982,886

CLASS 226

24	4,982,887

CLASS 227

18	4,982,888

CLASS 228

4.5	4,982,728
44.7	4,982,890
47	4,982,891
180.1	4,982,892
220	4,982,893

CLASS 229

69	4,982,894

CLASS 235

376	4,983,815
379	4,983,816
462	4,983,817
472	4,983,818
488	4,983,819
492	4,983,820

CLASS 237

2 A	4,982,895

CLASS 239

11	4,982,896
71	4,982,897
77	4,982,898
329	4,982,899
333	4,982,900
533.12	4,982,901
585	4,982,902
690.1	4,982,903

CLASS 241

73	4,982,904
79.1	4,982,905
179	4,982,906
236	4,982,907

CLASS 242

1.1 R	4,982,908
71.2	4,982,909
107	4,982,910
192	4,982,911
231	4,982,912

CLASS 244

3.22	4,982,913
56	4,982,914
98	4,982,915
122 AF	4,982,916
145	4,982,917
223	4,982,918

CLASS 246

382	4,982,919

CLASS 248

71	4,982,920
118	4,982,921
222.2	4,982,922
286	4,982,923
288.5	4,982,924
455	4,982,925
479	4,982,926
674	4,982,927

CLASS 250

23.4	4,982,858
207	4,983,821
223 B	4,983,822
225	4,983,823
227.27	4,983,824
231.16	4,983,825
231.18	4,983,826
235	4,983,827
237 G	4,983,828
282	4,983,829
309	4,983,830
	4,983,831
310	4,983,832
327.2	4,983,834
	4,983,835
330	4,983,836
334	4,983,837
338.3	4,983,838
	4,983,839
352	4,983,840
358.1	4,983,841
	4,983,842
370.02	4,983,843
382	4,983,844
397	4,983,833
423 R	4,983,845
458.1	4,983,846
483.1	4,983,847
	4,983,848
492.2	4,983,864
492.3	4,983,849
	4,983,850
493.1	4,983,851
500	4,983,322
504 R	4,983,852
554	4,983,853
561	4,983,854
577	4,983,855

CLASS 251

118	4,982,928
149.9	4,982,929

CLASS 252

8.6	4,983,309
32.7 E	4,983,310
62.54	4,983,311
67	4,983,312
68	4,983,313
71	4,983,314
102	4,983,315
174.15	4,983,316
174.24	4,983,317
299.01	4,983,318
314	4,983,319
350	4,983,320
387	4,983,321
551	4,983,323
587	4,983,324
600	4,983,325
603	4,983,326

CLASS 254

124	4,982,930

CLASS 256

13.1	4,982,931
47	4,982,932
65	4,982,933

CLASS 260

403	4,983,327
404.5	4,983,328
410.7	4,983,329

CLASS 261

52	4,983,330

CLASS 264

1.1	4,983,332
1.5	4,983,333
16	4,983,331
	4,983,334
25	4,983,335
40.5	4,983,336
41	4,983,337
45.1	4,983,338
56	4,983,339
63	4,983,340
102	4,983,341
113	4,983,342
142	4,983,343
255	4,983,344
313	4,983,345
328.1	4,983,346
508	4,983,347
509	4,983,348
	4,983,349

CLASS 266

105	4,982,934
106	4,982,935
249	4,982,936

CLASS 267

136	4,982,937
140.1	4,982,938

CLASS 269

32	4,982,939

CLASS 270

30	4,982,940

CLASS 271

84	4,982,941
119	4,982,942
157	4,982,943
204	4,982,944
213	4,982,945
251	4,982,946
263	4,982,947
293	4,982,948

CLASS 272

33 R	4,982,949
67	4,982,950
70	4,982,951
	4,982,952
73	4,982,953
93	4,982,954
118	4,982,955
	4,982,956
123	4,982,957
138	4,982,958

CLASS 273

1 GE	4,982,959
84 R	4,982,960
109	4,982,961
148 A	4,982,962
186 A	4,982,963
232	4,982,964
262	4,982,965
338	4,982,966
408	4,982,967
420	4,982,968

CLASS 277

27	4,982,889

CLASS 279

1 R	4,982,969
123	4,982,970

CLASS 280

30	4,982,971
121	4,982,972
152.1	4,982,973
164.2	4,982,974
281.1	4,982,975
426	4,982,976
661	4,982,977
675	4,982,978
707	4,982,979
801	4,982,981
808	4,982,982

CLASS 285

281	4,982,983

CLASS 292

201	4,982,984
327	4,982,985
336.3	4,982,986

CLASS 294

62	4,982,987
81.61	4,982,988
171	4,982,989

CLASS 295

21	4,982,990

CLASS 296

97.1	4,982,991
97.6	4,982,992
192	4,982,993
195	4,982,994
221	4,982,995

CLASS 297

194	4,982,996
296	4,982,997

CLASS 301

11 R	4,982,998

CLASS 303

9.630	4,982,999

CLASS 307

20	4,983,856
272.3	4,983,857
362	4,983,858
419	4,983,859
443	4,983,860
	4,983,861
446	4,983,862
492	4,983,863
571	4,983,865

CLASS 310

43	4,983,866
49 R	4,983,867
	4,983,868
90.5	4,983,869
	4,983,870
234	4,983,871
239	4,983,872
248	4,983,873
323	4,983,874
	4,983,875
328	4,983,876

CLASS 312

333	4,983,000

CLASS 313

140	4,983,877
308	4,983,878
402	4,983,879
506	4,983,880
607	4,983,881

CLASS 315

59	4,983,882
77	4,983,883
151	4,983,884
169.3	4,983,885
209 CD	4,983,886
224	4,983,887
242	4,983,888
246	4,983,889

CLASS 318

3	4,983,890
66	4,983,891
98	4,983,892
135	4,983,893
138	4,983,894
254	4,983,895
286	4,983,896
287	4,983,897
561	4,983,898
571	4,983,899
652	4,983,900
685	4,983,901
701	4,983,902

CLASS 320

2	4,983,903
15	4,983,904

CLASS 323

274	4,983,905

CLASS 324

77 E	4,983,919
79 D	4,983,906
158 P	4,983,907
	4,983,908
	4,983,909
	4,983,910
158 R	4,983,911
202	4,983,912
204	4,983,913
207.16	4,983,914
207.17	4,983,915
207.21	4,983,916
306	4,983,917
309	4,983,918
	4,983,920
	4,983,921
320	4,983,922
454	4,983,923

CLASS 328

72	4,983,924
151	4,983,925

CLASS 330

51	4,983,926
	4,983,927
254	4,983,928
288	4,983,929
	4,983,930

CLASS 331

111	4,983,931

CLASS 333

12	4,983,932
109	4,983,933
184	4,983,934
	4,983,935
202	4,983,936
	4,983,937
207	4,983,938

CLASS 335

42	4,983,939
126	4,983,940
255	4,983,941
301	4,983,942

CLASS 336

213 4,983,943

CLASS 337

91 B1 4,510,479

CLASS 338

22 R 4,983,944
32 R 4,983,945
200 4,983,946

CLASS 340

426 4,983,947
4,983,948
4,983,950
433 4,983,949
461 4,983,951
467 4,983,952
4,983,953
657 4,983,954
664 4,983,955
783 4,983,956
785 4,983,957
799 4,983,958
825.02 4,983,962
825.170 4,983,960
825.8 4,983,961
825.83 4,983,959
870.31 4,983,963
4,983,964

CLASS 341

72 4,983,965
84 4,983,966
110 4,983,967
118 4,983,968
4,983,969
122 4,983,970
133 4,983,971
138 4,983,973
143 4,983,972
156 4,983,974
166 4,983,975

CLASS 342

42 4,983,976
153 4,983,977
200 4,983,978
204 4,983,979
357 4,983,980
372 4,983,981
376 4,983,982
443 4,983,983

CLASS 343

711 4,983,984
741 4,983,985
771 4,983,986
797 4,983,987
853 4,983,988

CLASS 346

1.1 4,983,989
4,983,990
33 ME 4,983,991
76 PH 4,983,992
4,983,993
4,983,994

CLASS 350

1.6 4,983,001
3.6 4,983,002
3.61 4,983,003
3.66 4,983,004
96.12 4,983,005
96.14 4,983,006
96.15 4,983,007
96.16 4,983,008
96.18 4,983,009
96.20 4,983,010
4,983,011
96.21 4,983,012
96.23 4,983,013
96.24 4,983,014
96.25 4,983,015
126 4,983,016
162.17 4,983,017
167 4,983,018
313 4,983,019
317 4,983,020
332 4,983,021
333 4,983,022
344 4,983,023
354 4,983,024
377 4,983,025
422 4,983,026
427 4,983,027
609 4,983,028

CLASS 351

41 4,983,029
86 4,983,030

CLASS 353

10 4,983,031
30 4,983,032

CLASS 354

1 4,983,995
76 4,983,996
79 4,983,997
149.1 4,983,998
149.11 4,983,999
195.1 4,984,000
195.12 4,984,001
235.1 4,984,003
317 4,984,004
412 4,984,005
414 4,984,006
432 4,984,007

CLASS 355

24 4,984,008
27 4,984,009
4,984,010
4,984,011
4,984,012
38 4,984,013
67 4,984,014
68 4,984,015
72 4,984,016
91 4,984,017
200 4,984,018
215 4,984,019
218 4,984,020
245 4,984,021
246 4,984,022
260 4,984,023
273 4,984,024
274 4,984,025
277 4,984,026
290 4,984,027
297 4,984,028
310 4,984,029

CLASS 356

4 4,983,033
32 4,983,034
4,983,035
71 4,983,036
73.1 4,983,037
246 4,983,038
328 4,983,039
338 4,983,040
346 4,983,041
359 4,983,042
376 4,983,043
443 4,983,044

CLASS 357

13 4,984,031
16 4,984,032
17 4,984,033
4,984,034
4,984,035
22 4,984,036
4,984,037
23.14 4,984,043
23.6 4,984,030
4,984,038
23.7 4,984,040
4,984,041
23.9 4,984,042
24 4,984,044
4,984,045
26 4,984,046
30 4,984,047
34 4,984,048
38 4,984,049
41 4,984,050
42 4,984,051
49 4,984,052
50 4,984,053
51 4,984,054
54 4,984,055
67 4,984,056
68 4,984,057
4,984,058
4,984,059
4,984,060
4,984,061
70 4,984,062
72 4,984,063
80 4,984,064
81 4,984,065
82 4,984,066
236 4,984,039

CLASS 358

12 4,984,067
31 4,984,068
4,984,069
36 4,984,070
80 4,984,071
81 4,984,072
4,984,073
105 4,984,074
107 4,984,075
133 4,984,076
140 4,984,077
141 4,984,078
160 4,984,079
4,984,080
180 4,984,081
183 4,984,082
4,984,083
213.13 4,984,002
213.16 4,984,085
216 4,984,086
225 4,984,087
228 4,984,088
229 4,984,089
4,984,090
244 4,984,091
298 4,984,092
330 4,984,093
335 4,984,094
336 4,984,095
342 4,984,096
429 4,984,097

CLASS 360

12 4,984,098
46 4,984,099
49 4,984,100
65 4,984,101
4,984,102
77.14 4,984,104
85 4,984,105
92 4,984,106
4,984,107
4,984,108
94 4,984,109
95 4,984,110
96.5 4,984,111
96.6 4,984,112
074.100 4,984,103
101 4,984,113
103 4,984,114
106 4,984,115
109 4,984,116
124 4,984,117
125 4,984,118
128 4,984,119
4,984,120
130.34 4,984,121
132 4,984,122

CLASS 361

26 4,984,123
59 4,984,124
124 4,984,125
144 4,984,126
179 4,984,127
283 4,984,128
302 4,984,129
335 4,984,131
414 4,984,132
415 4,984,133
529 4,984,134

CLASS 362

8 4,984,135
66 4,984,136
74 4,984,137
85 4,984,138
153.1 4,984,139
187 4,984,140
4,984,141
249 4,984,142
293 4,984,143
339 4,984,144

CLASS 363

19 4,984,145
44 4,984,146
84 4,984,147
95 4,984,148

CLASS 364

200 4,984,149
4,984,150
4,984,151
4,984,152
4,984,153
4,984,154
4,984,195
321 4,984,130
401 4,984,155
407 4,984,156
413.04 4,984,158
413.13 4,984,157
413.16 4,984,159
413.19 4,984,160
424.1 4,984,161
426.02 4,984,163
4,984,164
4,984,165
426.04 4,984,166
431.04 4,984,167
449 4,984,168
464.01 4,984,170
469 4,984,169
477 4,984,171
478 4,984,172
508 4,984,173
513 4,984,174
4,984,175
4,984,176
513.5 4,984,177
514 4,984,178
518 4,984,179
4,984,162
4,984,180
519 4,984,181
521 4,984,182
551.01 4,984,183
707 4,984,184
721 4,984,185
724.17 4,984,186
725 4,984,187
900 4,984,188
4,984,189
4,984,190
4,984,191
4,984,192
4,984,193
4,984,194

CLASS 365

51 4,984,196
63 4,984,197
108 4,984,198
149 4,984,199
154 4,984,200
4,984,201
177 4,984,202
4,984,203
189.11 4,984,204
200 4,984,205
208 4,984,206
4,984,207
222 4,984,208
4,984,209
4,984,210
229 4,984,211
230.03 4,984,212
230.05 4,984,214
230.06 4,984,215
230.08 4,984,216
230.09 4,984,217
230.3 4,984,213

CLASS 366

117 4,983,045
312 4,983,046

CLASS 367

15 4,984,218
68 4,984,220
69 4,984,221
159 4,984,222

CLASS 368

76 4,984,223

CLASS 369

13 4,984,225
4,984,226
32 4,984,227
37 4,984,228
44.24 4,984,229
54 4,984,230
013 4,984,224
275.1 4,984,231
277 4,984,232

CLASS 370

16 4,984,233
58.1 4,984,234
60 4,984,235
4,984,237
100.1 4,984,236
105.1 4,984,238

CLASS 371

3 4,984,239
8.2 4,984,240
36 4,984,241

CLASS 372

45 4,984,242
46 4,984,243
59 4,984,245
69 4,984,246
461 4,984,244

CLASS 375

1 4,984,247
7 4,984,248
20 4,984,249
36 4,984,250
38 4,984,251
4,984,252
99 4,984,253
106 4,984,254
4,984,255

CLASS 376

245 4,983,350
254 4,983,351
272 4,983,352
283 4,983,353

CLASS 377

60 4,984,256

CLASS 378

13 4,984,257
145 4,984,258
146 4,984,259
173 4,984,260
202 4,984,261

CLASS 379

5 4,984,262
158 4,984,263
197 4,984,264
390 4,984,265
399 4,984,266
413 4,984,267
433 4,984,268
454 4,984,269

CLASS 380

24 4,984,270
25 4,984,271
4,984,272
39 4,984,219

CLASS 381

1 4,984,273
43 4,984,274
4,984,275
63 4,984,276
69.2 4,984,277
205 4,984,278

CLASS 382

1 4,984,279
7 4,984,280
4,984,281
8 4,984,282
28 4,984,283
48 4,984,284
50 4,984,285
54 4,984,286
59 4,984,287

CLASS 383

5 4,983,047

CLASS 384

43 4,983,048
45 4,983,049
99 4,983,050
4,983,051

CLASS 392

407 4,983,809

CLASS 398

209 4,984,084

CLASS 400

17 4,983,052
62 4,983,053
120 4,983,054
144.2 4,983,055
208 4,983,056
216.2 4,983,057
249 4,983,058

CLASS 401

78 4,983,059
86 4,984,288
140 4,983,060
148 4,983,061
195 4,983,062

CLASS 403

4 4,983,063
30 4,983,064
252 4,983,065
274 4,983,066

CLASS 405

3 4,983,067
36 4,983,068
43 4,983,069
124 4,983,070
154 4,983,071
184 4,984,289
216 4,983,072
224 4,983,073
227 4,983,074
267 4,983,075
284 4,983,076
288 4,983,077

CLASS 407

34 4,983,078

CLASS 408

230 4,983,079
241 R 4,983,080

CLASS 411

60 4,983,082
82 4,983,083
311 4,983,084
361 4,983,085
366 4,983,086

CLASS 414

24.5 4,983,087
27 4,983,088
276 4,983,089
326 4,983,090
331 4,983,091
408 4,983,092
416 4,983,093
621 4,983,094
786 4,983,095
789.5 4,983,096
795.2 4,983,097
798.9 4,983,098

CLASS 417

222 4,983,099
271 4,983,100
362 4,983,101
394 4,983,102
400 4,983,103
473 4,983,104
554 4,983,105

CLASS 418

2 4,983,106
9 4,983,107
63 4,983,108

CLASS 419

11 4,983,354
26 4,983,355

CLASS 420

35 4,983,356
418 4,983,357
425 4,983,358

CLASS 422

36.1 4,983,433
81 4,983,359
90 4,983,360
145 4,983,361
173 4,983,362
180 4,983,363
189 4,983,364
283 4,983,451

CLASS 423

230 4,983,365
240 4,983,366
244 4,983,367
327 4,983,368
338 4,983,369
340 4,983,370
344 4,983,371
395 4,983,372
489 4,983,373
593 4,983,374

CLASS 424

3 4,983,375
9 4,983,376
47 4,983,377
4,983,418
48 4,983,378
52 4,983,379
4,983,380
53 4,983,381
62 4,983,382
70 4,983,383
4,983,384
78 4,983,385
4,983,386
88 4,983,387
401 4,983,388
404 4,983,389
4,983,390
408 4,983,391
427 4,983,392
430 4,983,393
440 4,983,394
448 4,983,395
449 4,983,396
450 4,983,397
465 4,983,398
4,983,399
469 4,983,400
473 4,983,401
491 4,983,402

CLASS 425

7 4,983,109
110 4,983,111
116 4,983,110
136 4,983,112
183 4,983,113
203 4,983,114
228 4,983,115
517 4,983,116
563 4,983,117

CLASS 426

2 4,983,403
3 4,983,404
4,983,405
9 4,983,406
15 4,983,407
45 4,983,408
66 4,983,409

77 4,983,410
234 4,983,411
238 4,983,412
589 4,983,413
634 4,983,414

CLASS 427

1 4,983,415
2 4,983,416
11 4,983,417
53.1 4,983,419
77 4,983,420
130 4,983,421
228 4,983,422
230 4,983,423
243 4,983,424
340 4,983,425
347 4,983,427
407.1 4,983,426
443.1 4,983,428

CLASS 428

34.1 4,983,430
34.2 4,983,431
35.7 4,983,432
36.2 4,983,434
36.6 4,983,435
40 4,983,436
4,983,437
42 4,983,438
64 4,983,439
4,983,440
65 4,983,441
74 4,983,442
001 4,983,429
158 4,983,443
195 4,983,444
212 4,983,445
216 4,983,446
4,983,447
224 4,983,448
252 4,983,449
254 4,983,456
283 4,983,450
287 4,983,452
294 4,983,453
335 4,983,454
336 4,983,455
367 4,983,457
402 4,983,458
410 4,983,459
421 4,983,460
423.1 4,983,461
432 4,983,462
435 4,983,463
442 4,983,464
472 4,983,465
483 4,983,466
605 4,983,467
621 4,983,468
690 4,983,469

CLASS 429

16 4,983,470
19 4,983,471
38 4,983,472
48 4,983,473
59 4,983,474
160 4,983,475
197 4,983,476
222 4,983,477

CLASS 430

14 4,983,478
20 4,983,479
58 4,983,480
59 4,983,481
4,983,482
4,983,483
86 4,983,484
110 4,983,485
115 4,983,486
126 4,983,487
137 4,983,488
138 4,983,489
169 4,983,490
175 4,983,491
191 4,983,492
201 4,983,493
203 4,983,494
270 4,983,495
4,983,496
272 4,983,497
284 4,983,498
321 4,983,499
325 4,983,500
326 4,983,501
353 4,983,502
393 4,983,503
398 4,983,504
495 4,983,505
531 4,983,506
551 4,983,507
569 4,983,508
627 4,983,509

CLASS 431

115 4,983,118
253 4,983,119

CLASS 433

24 4,983,120
114 4,983,121
229 4,983,122

CLASS 434

21 4,983,123
226 4,983,124
258 4,983,125

CLASS 435

4 4,983,510
6 4,983,511
21 4,983,512
26 4,983,513
29 4,983,514
4,983,515
34 4,983,516
41 4,983,517
69.1 4,983,518
69.3 4,983,520
172.3 4,983,519
4,983,521
4,983,522
4,983,542
173 4,983,523
174 4,983,524
320 4,983,525

CLASS 436

55 4,983,526
63 4,983,527
141 4,983,528
512 4,983,529
518 4,983,530

CLASS 437

7 4,983,533
31 4,983,531
4,983,532
4,983,534
40 4,983,535
4,983,536
69 4,983,537
100 4,983,538
110 4,983,539
4,983,540
129 4,983,541
192 4,983,543
200 4,983,544
228 4,983,545
231 4,983,546
246 4,983,547
250 4,983,548

CLASS 439

61 4,983,126
79 4,983,127
214 4,983,128
395 4,983,129
407 4,983,130
456 4,983,131
786 4,983,132
860 4,983,133
884 4,983,134

CLASS 440

88 4,983,135

CLASS 445

47 4,983,136

CLASS 446

69 4,983,137
224 4,983,138

CLASS 449

30 4,983,139

CLASS 450

27 4,983,140

CLASS 455

33 4,984,290
38 4,984,291
40 4,984,292
133 4,984,293
166 4,984,294
186 4,984,295
193 4,984,296
619 4,984,297
4,984,298

CLASS 464

7 4,983,141
68 4,983,142
89 4,983,143

CLASS 474

111 4,983,144
117 4,983,145
4,983,146
206 4,983,147
263 4,983,148

CLASS 475

76 4,983,149
85 4,983,150
170 4,983,151
331 4,983,152
343 4,983,153

CLASS 493

315 4,983,154
369 4,983,155

CLASS 494

28 4,983,156
37 4,983,157
41 4,983,158

CLASS 500

174 4,983,759

CLASS 501

27 4,983,549
33 4,983,550
74 4,983,551
92 4,983,552
96 4,983,553
97 4,983,554
120 4,983,555
143 4,983,556

CLASS 502

26 4,983,557
31 4,983,558
32 4,983,559
85 4,983,560
107 4,983,561
112 4,983,562
150 4,983,563
166 4,983,564
242 4,983,565
401 4,983,566

CLASS 503

200 Re.33,517
208 4,983,568
217 4,983,569

CLASS 505

1 4,983,571
4,983,572
4,983,573
4,983,574
4,983,576
4,983,577
001 4,983,570
4,983,575

CLASS 512

3 4,983,578
6 4,983,579

CLASS 513

300 4,983,612

CLASS 514

2 4,983,580
12 4,983,581
23 4,983,582
54 4,983,583
4,983,584
57 4,983,585
58 4,983,586
63 4,983,587
64 4,983,588
4,983,589
4,983,590
65 4,983,591
92 4,983,592
110 4,983,593
137 4,983,594
174 4,983,595
210 4,983,596
4,983,597
211 4,983,598
212 4,983,599
214 4,983,600
219 4,983,601
229.5 4,983,602
232.8 4,983,603
238.5 4,983,604
247 4,983,605
248 4,983,606
253 4,983,607
256 4,983,608
274 4,983,609
300 4,983,611
309 4,983,613
317 4,983,614
337 4,983,615
339 4,983,616
341 4,983,617
367 4,983,618
371 4,983,619
395 4,983,620
397 4,983,621
411 4,983,622
414 4,983,623
423 4,983,624
455 4,983,625
458 4,983,626
510 4,983,627
4,983,628
530 4,983,629
531 4,983,630
552 4,983,631
557 4,983,632
622 4,983,633
4,983,634
643 4,983,635
699 4,983,636
724 4,983,637

CLASS 518

714 4,983,638

CLASS 521

59 4,983,639
60 4,983,640
82 4,983,641
88 4,983,642
159 4,983,643

CLASS 522

14 4,983,644
47 4,983,645

CLASS 523

220 4,983,647
351 4,983,648

CLASS 524

13 4,983,649
27 4,983,650
47 4,983,651
66 4,983,652
91 4,983,653
100 4,983,654
101 4,983,655
109 4,983,656
120 4,983,657
141 4,983,658
186 4,983,659
369 4,983,660
423 4,983,661
436 4,983,742
501 4,983,662
504 4,983,663
514 4,983,664
533 4,983,665
539 4,983,666
703 4,983,667

CLASS 525

23 4,983,668
47 4,983,669
54.2 4,983,670
63 4,983,671
65 4,983,672
92 4,983,673
97 4,983,674
100 4,983,675
107 4,983,676
127 4,983,677
193 4,983,678
194 4,983,679
281 4,983,680
290 4,983,681
4,983,682
329.1 4,983,684
331.8 4,983,685
351 4,983,686
356 4,983,687
389 4,983,688
390 4,983,683
412 4,983,689
436 4,983,690
437 4,983,691
535 4,983,692

CLASS 526

124 4,983,693
125 4,983,694
142 4,983,695
159 4,983,696
206 4,983,697
207 4,983,698
240 4,983,699

CLASS 528

15 4,983,701
28 4,983,702
34 4,983,700
49 4,983,703
69 4,983,704
170 4,983,705
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CLASS 574

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CLASSIFICATION OF DESIGNS

D2—	190	313,495			313,528		65	313,561			313,593		59	313,628		139	313,658
	244	313,497	D7—	317	313,529		73	313,562			313,594		62	313,625	D26—	2	313,606
	250	313,496		354	313,530		78	313,563			313,595		76	313,626		3	313,659
	314	313,498		360	313,531		92	313,564		163	313,596		88	313,629		9	313,660
D3—	28	313,499		363	313,532		93	313,566			313,597	D20—	10	313,630		31	313,661
	30.1	313,508		380	313,533		94	313,565			313,598		41	313,631		37	313,662
	34	313,501		515	313,534		106	313,567		214	313,599	D21—	28	313,632		38	313,663
	35	313,500		535	313,535			313,568		241	313,600		81	313,633		42	313,664
	39	313,502		679	313,536		114	313,569			313,601		129	313,634		44	313,665
	45	313,503		686	313,537		118	313,570			313,602		148	313,635		52	313,666
	63	313,504	D8—	8	313,538	D11—	86	313,571	D15—	11	313,603		171	313,636		69	313,667
	74	313,505		14	313,539		160	313,572		70	313,604		190	313,637		87	313,668
	76	313,506		98	313,540		164	313,573		78	313,605		199	313,638		109	313,669
	105	313,507		301	313,541			313,574	D16—	132	313,607		203	313,639		113	313,670
D4—	137	313,509		308	313,542			313,575		202	313,608		239	313,640	D28—	35	313,671
D5—	20	313,510		338	313,543			313,576	D17—	20	313,609	D22—	119	313,641		46	313,672
	28	313,511		355	313,544	D12—	14	313,577		22	313,610	D23—	207	313,642	D29—	7	313,673
	53	313,512			313,545		91	313,578	D18—	12	313,611		209	313,643		20	313,674
D6—	347	313,513		373	313,546		112	313,579			313,612		212	313,644	D30—	125	313,675
	360	313,514			313,547		146	313,580		13	313,613		213	313,645		145	313,676
	380	313,515			313,548			313,581		23	313,614		255	313,646		152	313,677
	384	313,516			313,549			313,582		36	313,615		275	313,647	D32—	2	313,678
	425	313,517			313,550		214	313,583			313,616		295	313,648		6	313,679
	428	313,518			313,551		305	313,584		37	313,617		300	313,649		21	313,680
	467	313,519	D9—	319	313,552		310	313,585		42	313,618		386	313,650		22	313,681
		313,520		338	313,553	D13—	146	313,587	D19—	27	313,619	D24—	9	313,651		49	313,682
	501	313,521		415	313,554		154	313,588		34	313,627		17	313,652		68	313,683
	547	313,522		424	313,555		182	313,586		48	313,620		52	313,653	D34—	11	313,684
	553	313,524		425	313,556	D14—	114	313,589			313,621	D25—	119	313,654		29	313,685
	560	313,523		432	313,557			313,590			313,622		124	313,655		40	313,686
	611	313,525		449	313,558		118	313,591			313,623			313,656		42	313,687
		313,526	D10—	37	313,559		159	313,592		55	313,624		138	313,657	D99—	29	313,688
		313,527		57	313,560												

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P.—	9	7,414		7,415		10	7,417		57	7,416		

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DESIGN PATENTS

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PLANT PATENTS

06 : 7,416
7,417

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